



US Army Corps  
Of Engineers  
Wilmington District

# PUBLIC NOTICE

Issue Date: 10/07/2005  
Comment Deadline: 11/09/2005  
Corps Action ID #: 200610015

All interested parties are hereby advised that the Wilmington District, Corps of Engineers (Corps) has received an application for work within jurisdictional waters of the United States. Specific plans and location information are described below and shown on the attached plans. This Public Notice and all attached plans are also available on the Wilmington District Web Site at [www.saw.usace.army.mil/wetlands](http://www.saw.usace.army.mil/wetlands)

**Applicant:** *Mr. Donald R. Abrams, Deputy Base Civil Engineer  
United States Air Force – Seymour Johnson Air Force Base  
4 CES/CD  
1095 Peterson Avenue  
Seymour Johnson Air Force Base, North Carolina 27531-2355*

**AGENT (if applicable):** *Not Applicable*

## Authority

The Corps will evaluate this application and decide whether to issue, conditionally issue, or deny the proposed work pursuant to applicable procedures of Section 404 of the Clean Water Act (33 U.S.C. 1344).

## Location

Project area is located on either side of McColpin Road between Blakeslee Avenue and Gentile Road on board Seymour Johnson Air Force Base adjacent to the City of Goldsboro, Wayne County, North Carolina. This area consists of approximately 6 acres immediately north of the existing flight line and runway.

## Existing Site Conditions

The project area is primarily an undisturbed, wooded parcel adjacent to the Seymour Johnson Air Force Base (SJAFB) flight line that contains an unnamed tributary flowing to the Neuse River. It is the only remaining, undeveloped parcel located within the Aircraft Operations and Mobility Development Area (AOMDA).

The surrounding land use consists of a 3,233-acre military facility situated in the east-central portion and Coastal Plain of North Carolina. The base itself consists primarily of gently rolling topography with elevations between 48 and 120 feet, mean sea level. SJAFB is located within the Neuse River Basin and is bordered by both the Neuse River and Stoney Creek. Most of the acreage on SJAFB consists of improved grounds. The southern half of the base is comprised of the airfield complex and flight line. The remainder of the installation contains residential areas, a variety of buildings and complexes, recreation facilities, training areas, small forested / undeveloped areas, and vacant tracts along the Neuse River and Stoney Creek.

### **Applicant's Stated Purpose**

The purpose and need of the proposed project is to construct of two flight line support facilities within the space-limited AOMDA. The proposed facilities consist of a Type III hydrant fueling system and a combined mobility processing center.

### **Project Description**

The project involves routing 3,085 linear feet of Section 404 jurisdictional waters into a culvert to facilitate the construction of flight line support facilities. SJAFB needs to clear its flight line of structures that encroach into the airfield lateral safety clearance zone and replace these facilities adjacent to the flight line. Specifically, existing pumphouses in the clearance zone are old and difficult to repair causing fuel leaks that increase the potential for mission delays. The base also needs available and secure land adjacent to the flight line on which to build new flight line support facilities. To meet these needs the project includes:

1. demolishing the existing fuel system buildings and underground storage tanks adjacent to Taxiway A and construct a Type III hydrant fueling system with pump house and above-ground storage tanks located outside the airfield lateral safety clearance zone;
2. demolishing two existing deployment buildings and construct a combined mobility processing center and War Reserve Material (WRM) storage facility.

### **Other Required Authorizations**

This notice and all applicable application materials are being forwarded to the appropriate State agencies for review. The Corps will generally not make a final permit decision until the North Carolina Division of Water Quality (NCDWQ) issues, denies, or waives State certification required by Section 401 of the Clean Water Act (PL 92-500). The receipt of the application and this public notice in the NCDWQ Central Office in Raleigh serves as application to the NCDWQ for certification. A waiver will be deemed to occur if the NCDWQ fails to act on this request for certification within sixty days of the date of the receipt of this notice in the NCDWQ Central Office. Additional information

regarding the Clean Water Act certification may be reviewed at the NCDWQ Central Office, 401 Oversight and Express Permits Unit, 2321 Crabtree Boulevard, Raleigh, North Carolina 27604-2260. All persons desiring to make comments regarding the application for certification under Section 401 of the Clean Water Act should do so in writing delivered to the North Carolina Division of Water Quality (NCDWQ), 1650 Mail Service Center, Raleigh, North Carolina 27699-1650 Attention: Ms. Cyndi Karoly by November 9, 2005.

The applicant has not provided to the Corps, a certification statement that his/her proposed activity complies with and will be conducted in a manner that is consistent with the approved North Carolina Coastal Zone Management Program. Pursuant to 33 CFR 325.2(b)(2), the Corps can not issue a permit for the proposed work until the applicant submits such a certification to the Corps and the North Carolina Division of Coastal Management (NCDCM), and the NCDCM notifies the Corps that it concurs with the applicant's consistency certification.

### **Essential Fish Habitat**

This notice initiates the Essential Fish Habitat (EFH) consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. The Corps' initial determination is that the proposed project will not adversely impact EFH or associated fisheries managed by the South Atlantic or Mid Atlantic Fishery Management Councils or the National Marine Fisheries Service.

### **Cultural Resources**

The Corps has consulted the latest published version of the National Register of Historic Places and is not aware that any registered properties, or properties listed as being eligible for inclusion therein are located within the project area or will be affected by the proposed work. Presently, unknown archeological, scientific, prehistoric, or historical data may be located within the project area and/or could be affected by the proposed work.

### **Endangered Species**

The Corps has reviewed the project area, examined all information provided by the applicant and consulted the latest North Carolina Natural Heritage Database. Based on available information, the Corps has determined pursuant to the Endangered Species Act of 1973, that the proposed project will have no effect on federally listed endangered or threatened species or their formally designated critical habitat.

## **Evaluation**

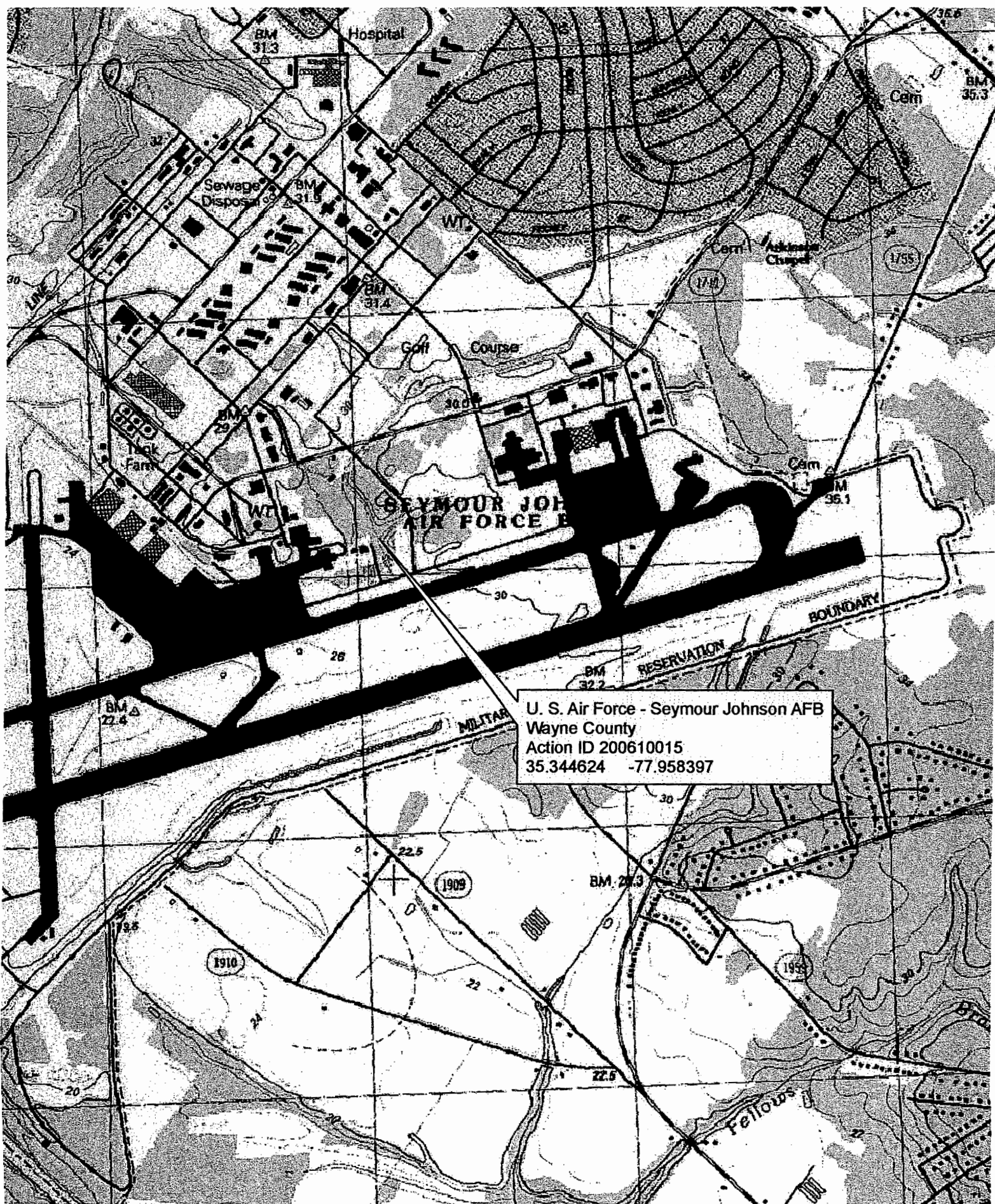
The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values (in accordance with Executive Order 11988), land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people. For activities involving the discharge of dredged or fill materials in waters of the United States, the evaluation of the impact of the activity on the public interest will include application of the Environmental Protection Agency's 404(b)(1) guidelines.

## **Commenting Information**

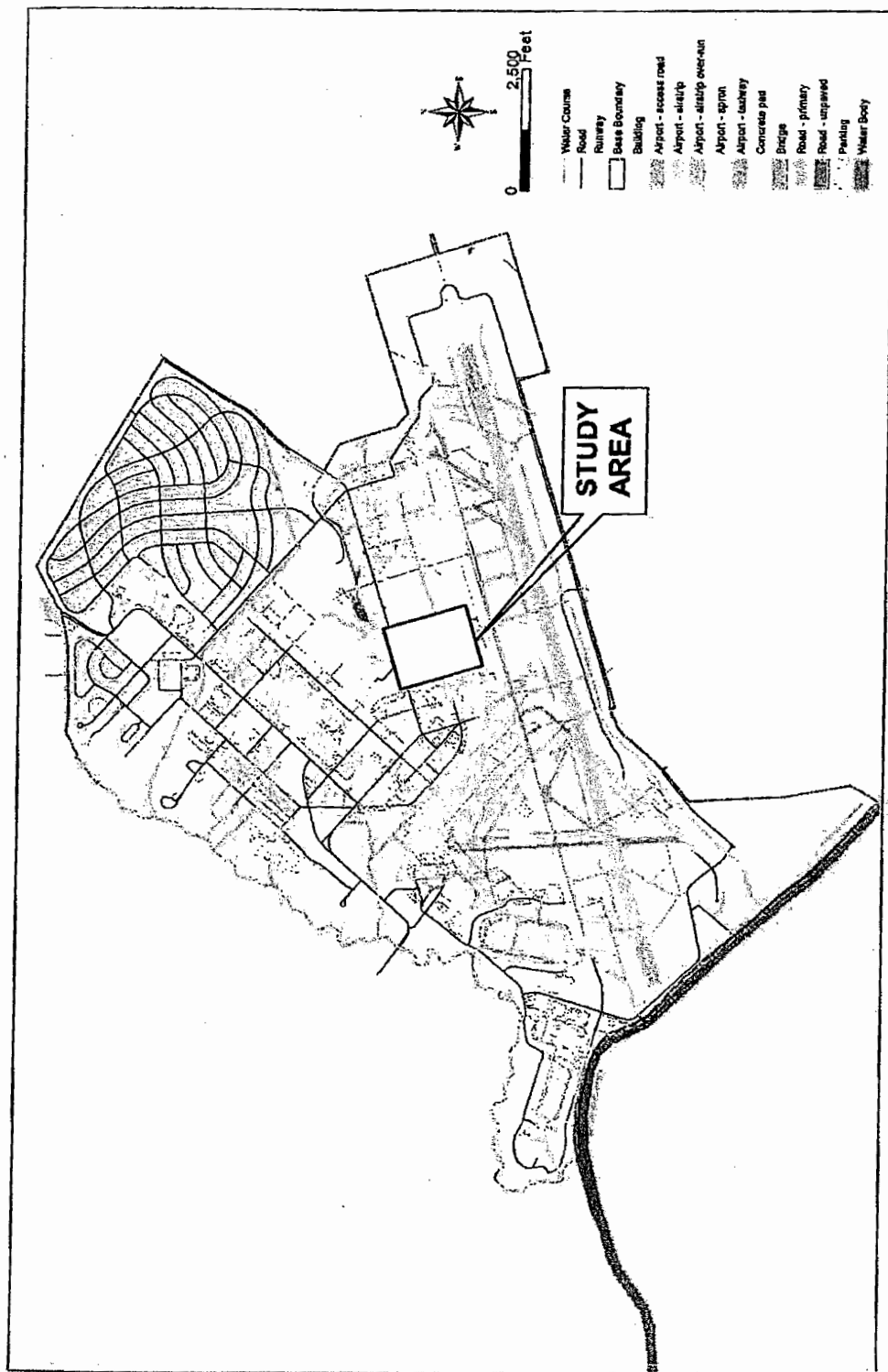
The Corps is soliciting comments from the public; Federal, State and local agencies and officials, including any consolidate State Viewpoint or written position of the Governor; Indian Tribes and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment (EA) and/or an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA). Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider the application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing. Requests for a public hearing shall be granted, unless the District Engineer determines that the issues raised are insubstantial or there is otherwise no valid interest to be served by a hearing.

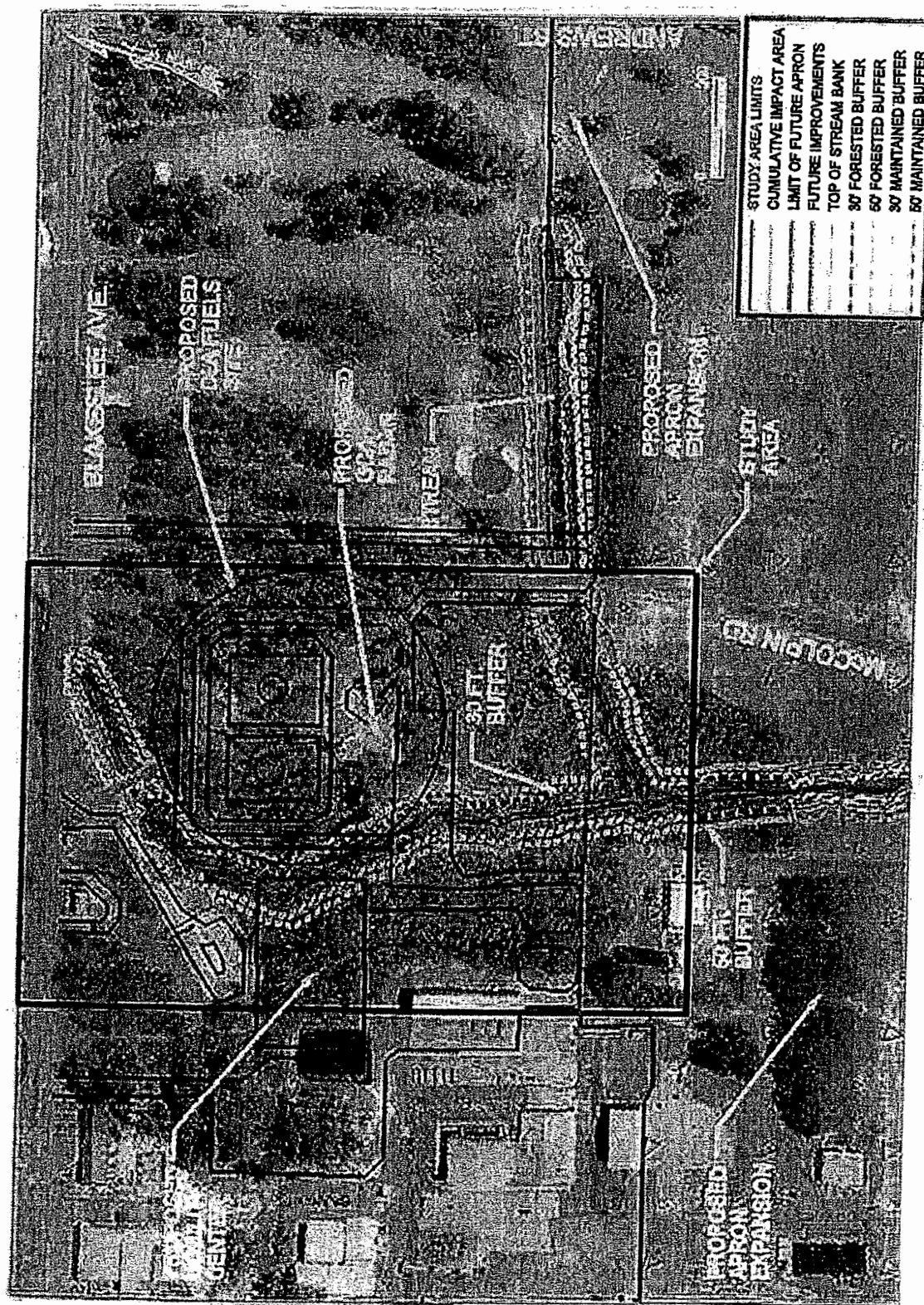
Written comments pertinent to the proposed work, as outlined above, will be received by the Corps of Engineers, Wilmington District, until 5pm, November 9, 2005. Comments should be submitted to Mr. Scott Jones at Post Office Box 1000, Washington, North Carolina 27889.



U. S. Air Force - Seymour Johnson AFB  
Wayne County  
Action ID 200610015  
35.344624 -77.958397



**Figure 2**  
**Study Area**



**Figure 3**  
Proposed Development Alternative

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**HYDRANT FUEL SYSTEM IMPROVEMENTS  
SEYMOUR JOHNSON AFB, NORTH CAROLINA**

**DRAINAGE PLAN**

**PREPARED BY  
U.S. ARMY CORPS OF ENGINEERS  
OMAHA DISTRICT**

**1. Introduction.**

In the site design for the hydrant fuel improvements at Seymour Johnson AFB, North Carolina, the requirements of the State of North Carolina relating to the treatment of storm water runoff have been taken into account. For projects located in the State of North Carolina, the following criteria must be addressed:

- a. The peak discharge from a 1-year 24-hour event must not be increased.
- b. The nitrogen export level must be less than 3.6 lbs/ac/yr or provide BMP, offset payment or combination of the two to meet the requirements of the reduction options.
- c. Address the total suspended solids from the storm water runoff.

Following is a discussion dealing with the manner and extent to which each of the above requirements has been dealt with in the design.

**2. Peak Discharge.**

The storm drainage system was designed to accommodate the peak discharges resulting from a 10-year frequency storm event. Discharges were computed utilizing the Hydraflow computer program developed by Intellisolve. The SCS hydrologic method was used to generate 24-hour unit hydrographs for the individual and combined drainage areas. These hydrographs were then used to generate the hydrographs for the existing and proposed conditions (after construction) for a 1-year and the 10-year and 100-year frequency events. From these hydrographs, peak discharges and basin routing parameters have been developed. These discharges were then utilized to evaluate the changes in the peak discharge leaving the site (1-year event) and in the calculation of the inlet and pipe sizes for the new system (10-year and 100-year events). The 24-hour rainfall amounts used in the analysis were 3.0 inches (1-year), 5.9 inches (10-year) and 8.4 inches (100-year).

Plates 1 and 2 show the drainage areas contained within the boundaries of the immediate project site for the existing and proposed conditions. Inflow points I and II represent locations at which

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offsite drainage is collected and routed directly to the stream or conduit extension. The Outflow point identified at the southern end of the site represents the location at which the comparison of the existing and proposed conditions peak discharges will be evaluated. In this evaluation, it has been assumed that the contribution of Inflow points I and II and that the timing of the flows from the site perimeter will not be changed. Therefore the comparison in the peak flows can be made utilizing only the values from the contributing areas immediately within the site boundaries.

Approximately 40% of the onsite flows (Areas A25, A27 & A31; See Plate 2) were routed through the detention basin. This routing captured the 1-year 24-hour event from this area, which from a volumetric standpoint is slightly greater than the first inch of runoff. By capturing this water it not only helped in the reduction of the peak discharge, but also addressed the treatment of nitrogen and total suspended solids loading.

The extension of the Blakeslee Avenue conduit through the project site created a barrier which limited the direct access of a portion of the site flows to the basin. The runoff from Areas A3, A6-A8, A11, A13 and A15 was not able to be routed through a detention basin for this reason. However the impervious surfaces from these areas have been collected and piped below grade to an infiltration trench and as such do not contribute to the peak discharge. Areas A6 and A7 have not been included in calculating the peak discharge since they are containment areas that will be discharged during off-peak periods and as such will not be contributing during a rainfall event. Area A1 presently flows directly to the stream under both the existing and proposed conditions. Areas A36 and A39 are downstream of the detention basin and flow directly into the stream. (See Plate 2)

Based upon these assumptions the existing and proposed conditions peak discharges for the 1-year, 24-hour event at the outflow point are (See Attachments 1 and 2 for detailed breakout):

Existing Conditions Peak Discharge = 7.9 cfs

Proposed Conditions Peak Discharge = 5.7 cfs

Though the size of the impervious area increases between the existing and proposed conditions the reduction of the peak discharge is accomplished through the routing of Areas A25, A27 & A31 through the detention basin.

### 3. Reduction In Nitrogen Loading.

The State of North Carolina criteria relating to nitrogen loading states that the total nitrogen loading output from a site cannot be greater than 3.6 lbs/ac/yr using an incremental loading of 1.2 lbs/ac/yr for permanently protected managed open space and 21.2 lbs/ac/yr from impervious surfaces. An audit was conducted to determine what the nitrogen loading would be for the runoff leaving the site assuming no on-site treatment is performed. Those areas disturbed as a result of the project were identified and included in the analysis for the nitrogen loading (See Plate 3).

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Following are the nitrogen loading calculations for the proposed conditions:

Permanently protected open space:	$1.2 \text{ lbs/ac/yr} \times 5.1 \text{ ac}$	=	6.1 lbs/yr
Impervious surfaces:	$21.1 \text{ lbs/ac/yr} \times 3.2 \text{ ac}$	=	67.5 lbs/yr
Total:			<u>73.6 lbs/yr</u>
Average nitrogen loading:	$73.6 \text{ lbs/yr} \times 1/8.3 \text{ ac}$	=	8.9 lbs/ac/yr

Under the current design, areas A25, A27 and A31 are routed through a detention basin designed as an infiltration basin from which a 25% (wet detention) reduction in nitrogen loading can be realized. Utilizing this reduction lowers the total nitrogen loading from these areas (A25, A27, A31) to:

Before treatment (Areas A25, A27, A31):

Permanently protected open space:	$1.2 \text{ lbs/ac/yr} \times 3.1 \text{ ac}$	=	3.7 lbs/yr
Impervious surfaces:	$21.1 \text{ lbs/ac/yr} \times 2.3 \text{ ac}$	=	48.5 lbs/yr
Total:			<u>52.2 lbs/yr</u>

After treatment (Areas A25, A27, A31):

Permanently protected open space:	$1.2 \text{ lbs/ac/yr} \times 3.1 \text{ ac} \times .75$	=	2.8 lbs/yr
Impervious surfaces:	$21.1 \text{ lbs/ac/yr} \times 2.3 \text{ ac} \times .75$	=	36.4 lbs/yr
Total:			<u>39.2 lbs/yr</u>

Reduction In Loading: (Areas A25, A27, A31)	$52.2 - 39.2$	=	13.0 lbs/yr
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Adjusted Total:	$73.6 - 13.0$	=	60.6 lbs/yr
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Adjusted Average nitrogen loading:	$60.6 \text{ lbs/yr} \times 1/8.3$	=	7.3 lbs/ac/yr
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Since the loading is still greater than the requirement of 3.6 lbs/ac/yr an offset payment will be required. The size of this offset payment will be:

Amount of offset payment:	$(7.3 - 3.6) \text{ lbs/ac/yr} \times 8.3 \text{ ac} \times \$330/\text{ac}$	=	\$9,853
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### **4. Total Suspended Solids.**

The State of North Carolina criteria, addressing total suspended solids for storm water runoff, has been addressed during the development of the design scenario. In order to meet this criteria, the runoff from those areas which presently drain overland through the 50 foot buffer strip adjacent to a natural waterway, prior to entering that waterway, must be treated through the implementation of one of the available BMPs. Site constraints restrict the collection of all the runoff to a centralized location for treatment and thus several design elements have been incorporated to meet the criteria (See Plate 4).

**4.1.** Areas A1 and A39 represent transitional areas located adjacent to the project site. These areas will not be disturbed as a result of the construction activities. No additional impervious area will be added and runoff patterns from these sites will remain the same.

**4.2.** Areas A3, A8, A11, A13 and A15 will have the first 1" of runoff from the new impervious areas collected and routed underground for infiltration. Roof drain lines will drain to underground collection pipes. These pipes are sized to hold the first 1-inch of rainfall and are perforated with a filter fabric wrap and gravel backfill. At a minimum, the first 1-inch of rainfall will infiltrate into the native fine sandy soil. For heavy storm events, overflows are provided for excess storm water to discharge to grassy areas that drain to storm inlets. Any remaining pervious areas (sidewalks/equipment pads) will drain through grassed areas prior to being collected in area inlets and routed to the stream.

**4.3.** Areas A6 and A7 are the containment areas for the two above ground storage tanks. The storm water runoff from these areas will be controlled as described in the spill containment paragraph below. Grit chambers are provided at the containment area inlets. No significant runoff is expected from the fillstands as these are covered by a canopy. The above ground storage tank (AST) containment areas will drain to the storm drainage system. The site grades and groundwater elevations do not allow for these areas to drain to the infiltration basin or a French drain system (similar to the roof drains). Past experience has proven that the storm water collected within the concrete surfaced AST containment areas is quite clear (little suspended solids). No vehicles can enter these areas.

**4.4.** The runoff from Areas A25, A27 and A31 will have the first 1" of runoff collected and routed to an infiltration basin.

The parameters utilized in the design of the detention/infiltration basin include:

- a. 1" of runoff over the contributing drainage areas served by the basin must be retained in the basin for treatment.
- b. The stored water comprising the first 1" of runoff must be infiltrated into the ground within 48 - 120 hours after the storm event.
- c. A control structure will allow for the bypassing of heavy discharges around the basin and be designed such that the 100-year event does not overtop the embankment.

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Using the above guidance and based upon the following parameters the design was developed:

- a. **1" of runoff** = 236,800 square feet (5.4 ac) x 1.0 inches  
= 19,733 cubic feet  
= 0.45 acre-feet
- b. **Basin dimensions**  
  
Actual volume of retained pool = 0.59 acre feet  
Elev. of overflow weir at control structure = 86.50  
  
Bottom of basin = Elev. 83.5  
Actual elevation of basin during 1-year event = Elev. 86.0  
Top of basin = Elev. 89.0  
  
Approximate dimensions of basin = 93 Feet x 75 Feet
- c. **Required length of time required to percolate into soil = 48 - 120 hours**  
  
Length of time required to infiltrate into soil =  
3.0 feet of depth at 0.52 in/hour (Accommodations have been made to the Eartwork specification for basin construction such that this minimum infiltration rate is achieved.)  
= 69 hours
- d. **Bottom of the basin must be located 2 feet above seasonal high water table**  
  
The bottom of the basin has been set at 83.5. Groundwater observations taken during collection of soil borings indicated that the groundwater in this area varies and subsequently daylight into the channel that crosses the site. (Approximate elevation 80.0) As part of the proposed project a 4' x 8' box culvert will be constructed along the alignment of the existing channel and the channel filled in. As a result of filling in of the channel it is anticipated that the groundwater in the area of the basin will rise. To what extent the groundwater will rise is unknown however as a means to accommodate this anticipated rise, a drain tile system will be constructed below the basin. This drainage system will be constructed a minimum of two feet below the bottom of the basin and will assure that there is positive drainage through the bottom of the basin.
- e. **Drainage area draining to basin = 5.4 Acres**  
(Approximately equal to 5 Ac. requirement)
- f. **Protect the surface of the basin bottom** The bottom of basin to be constructed with grassed bottom.

## DRAFT

### g. Excess runoff allowed to bypass basin

The first 1 inch of runoff will be collected by Area Inlet G-1 and routed to the basin. After the basin fills the water will pond over Area Inlet G-1 until such time as it reaches elevation 86.5. At this time the water will enter Area Inlet F-1, F-2 and F-3 and be carried to the stream through a 24 inch outfall line. These inlets and outfall lines have been sized to accommodate a 100 year frequency event. Should Area Inlets F-1, F-2 and F-3 clog and water not be allowed to enter, the water will rise to elevation 87.5 and flow overland to the stream and not disturb the collected water in the basin.

Maintenance of the infiltration basin will be critical to its long term performance. All requirements as listed in the permit application will be followed to assure that the basin continues to provide the required treatment. Required maintenance tasks to be performed by the base include but are not limited to:

- a. Annual inspections shall be conducted after a storm event to ensure infiltration performance.
- b. Grass filters leading to infiltration basins shall be mowed at least twice a year.
- c. Sediment deposits shall be removed from pretreatment devices at least annually.
- d. Removal and reconstruction of the infiltration device will be required when the infiltration rate falls to unacceptable levels.

## 5. Drainage Of Containment Areas.

Those areas constructed to contain fuel spills have been designed based upon the following criteria:

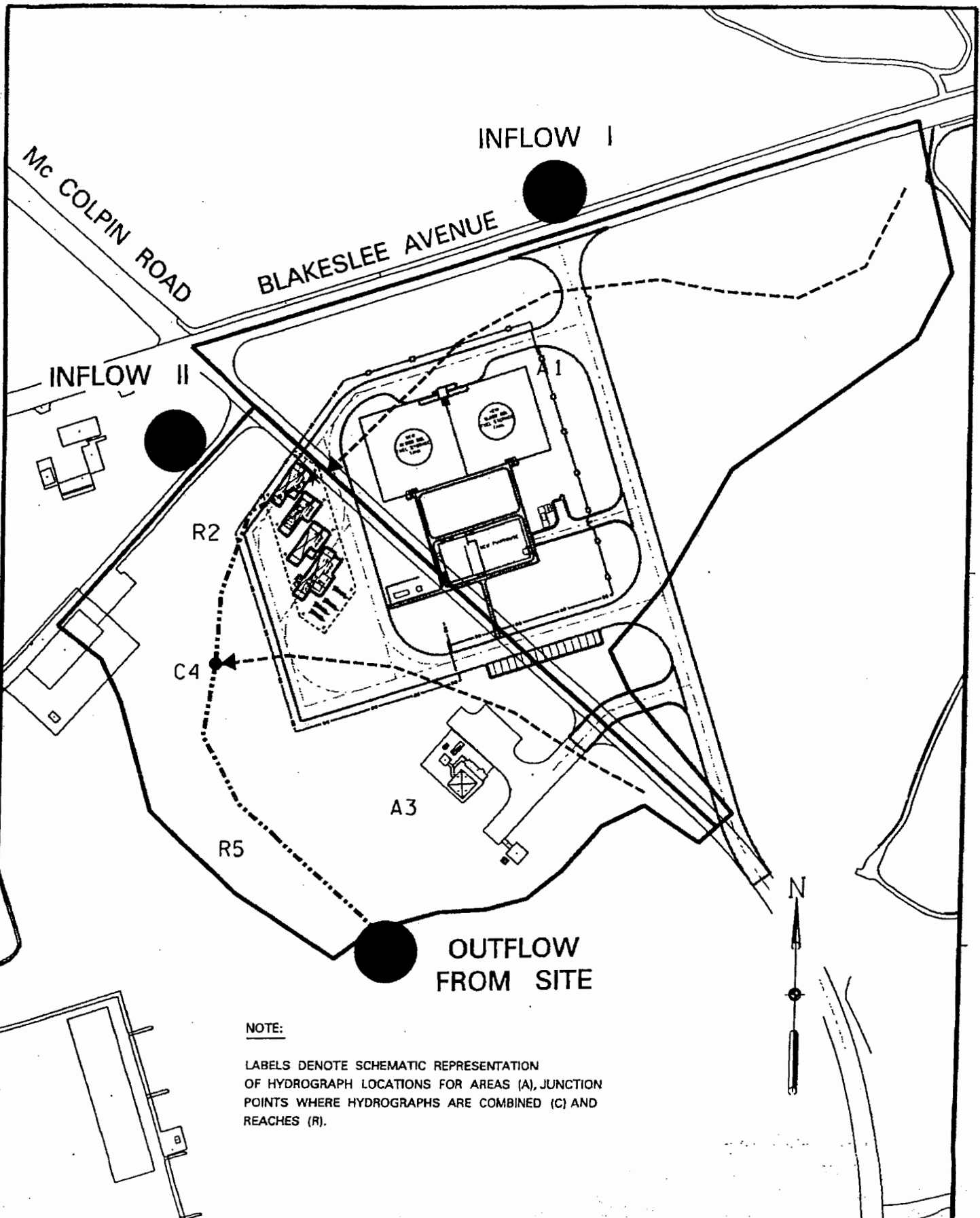
**5.1. Fuel Storage Tank Containment Dikes.** The containment volume within the diked area is equal to the tank volume plus one foot of freeboard. Each of the fuel storage tank containment dike areas will be drained to two low spots located within the dike walls. A gate valve will be provided to control the drainage of the basin. The gate valve will normally be closed to prevent any leakage in the event of a fuel spill. After a rainfall and in the absence of a film on the standing water, the valve will be opened to drain to the storm drainage system. Should a film be present on the ponded water, the water will be treated onsite prior to discharging (Base to verify).

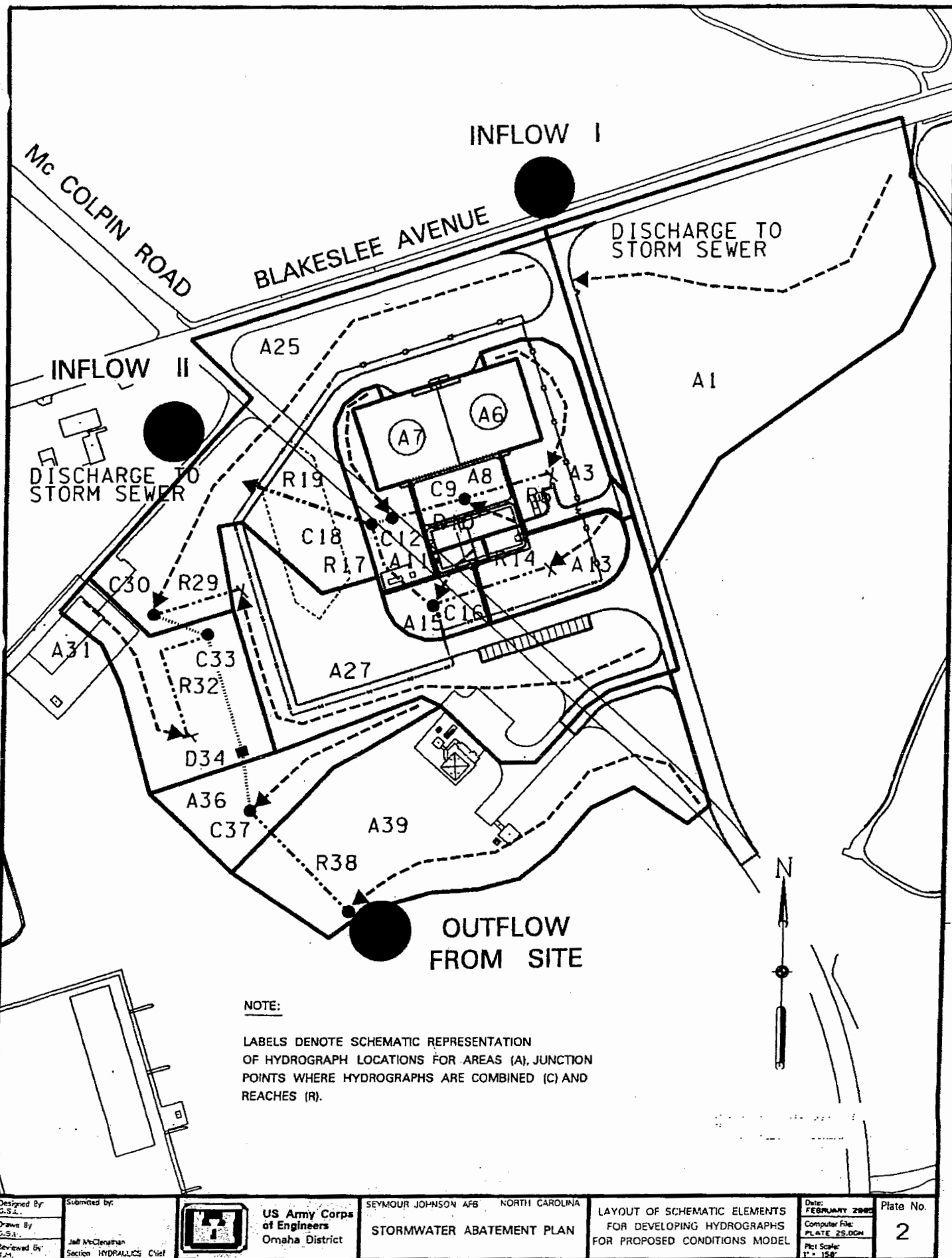
**5.2. Truck Fillstands.** The truck fillstands will be drained to a low spot in the pad and routed to a collection basin. A gate valve in the basin will be provided to control drainage. The gate valve will normally be closed to prevent any leakage in the event of a fuel spill. After a rainfall and in the absence of a film on the standing water, the valve will be opened to drain via pipe to the storm drainage system. Should a film be present on the ponded water, the water will be treated onsite prior to discharging (Base to verify).

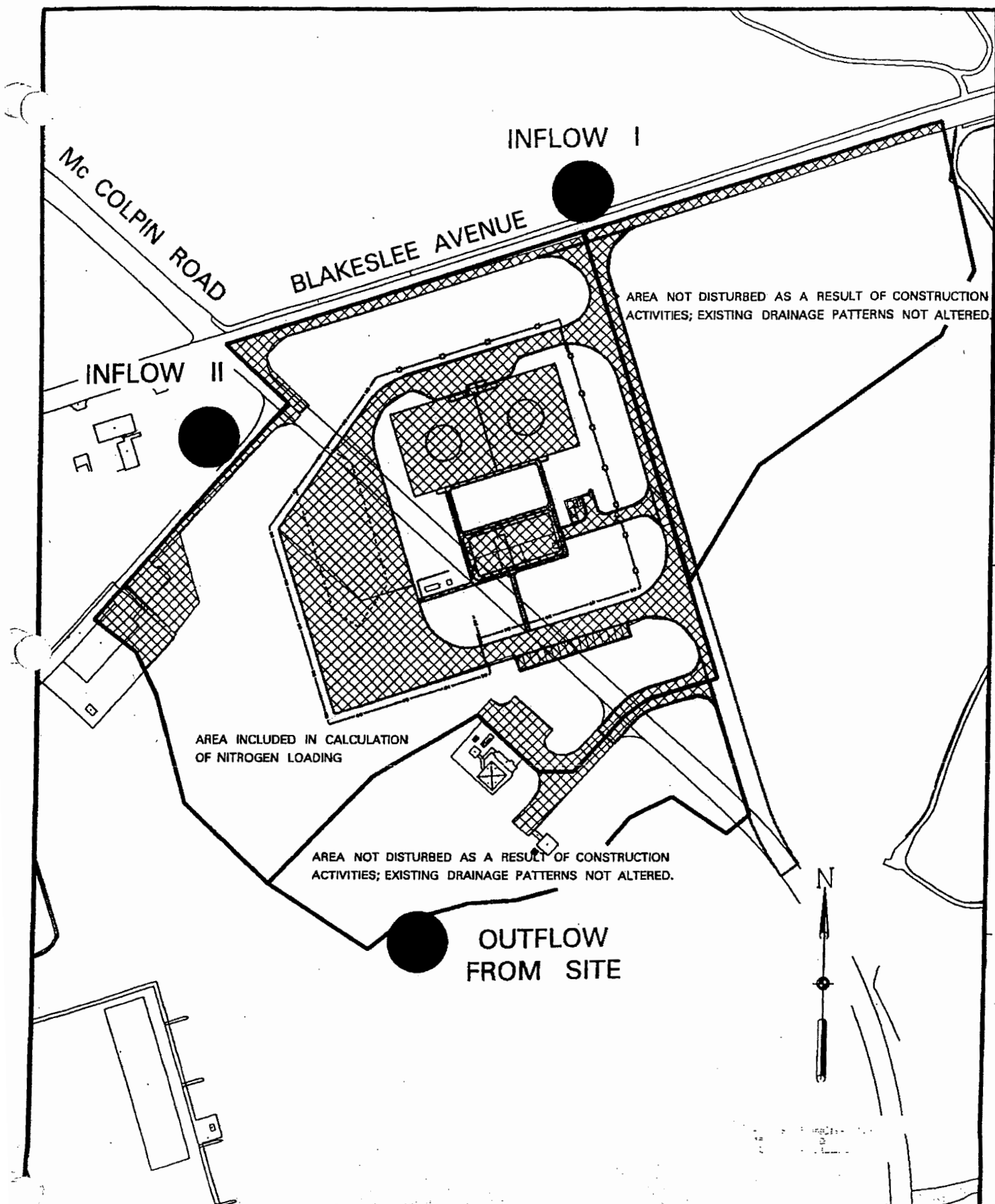
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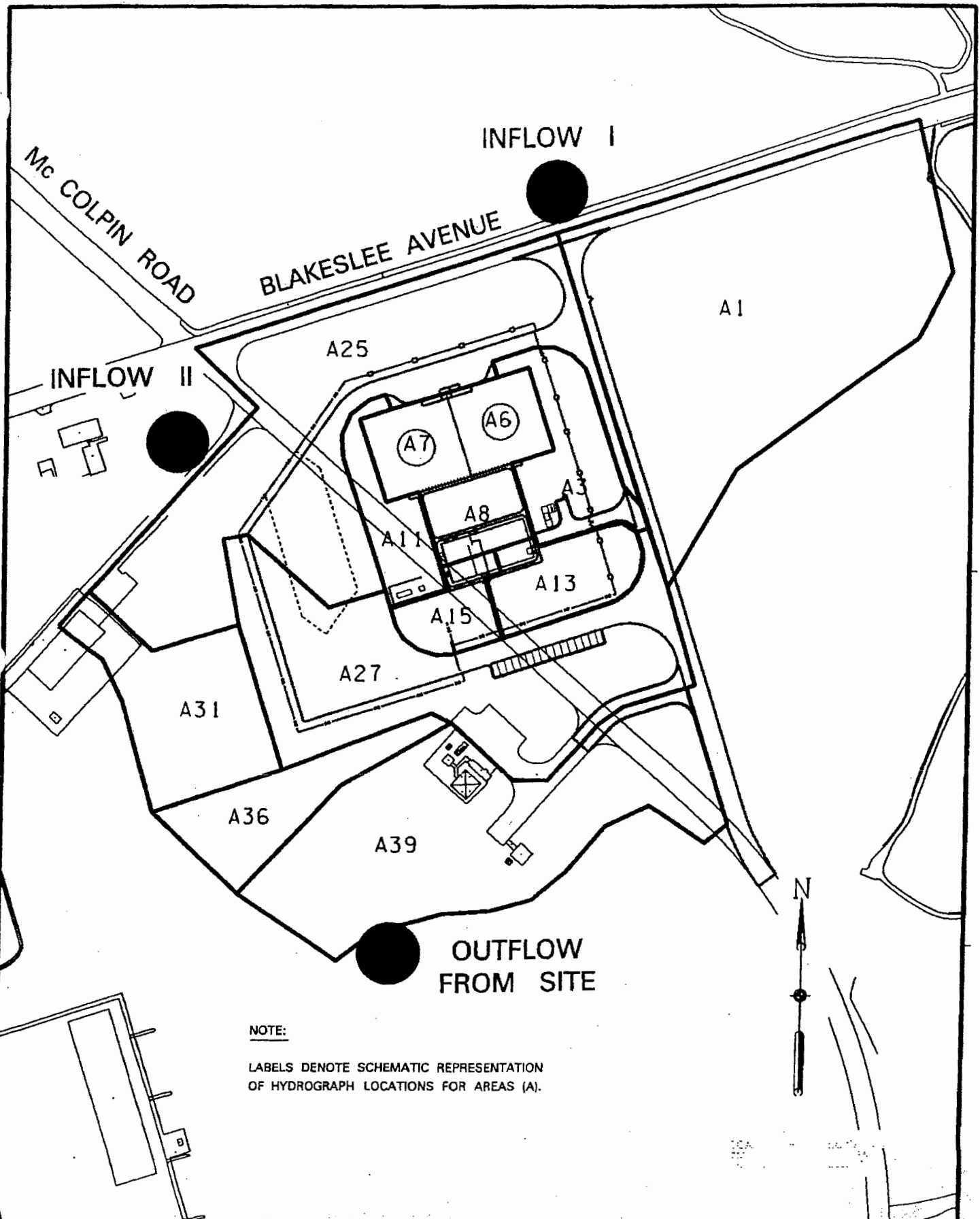
**6. Conclusion.**

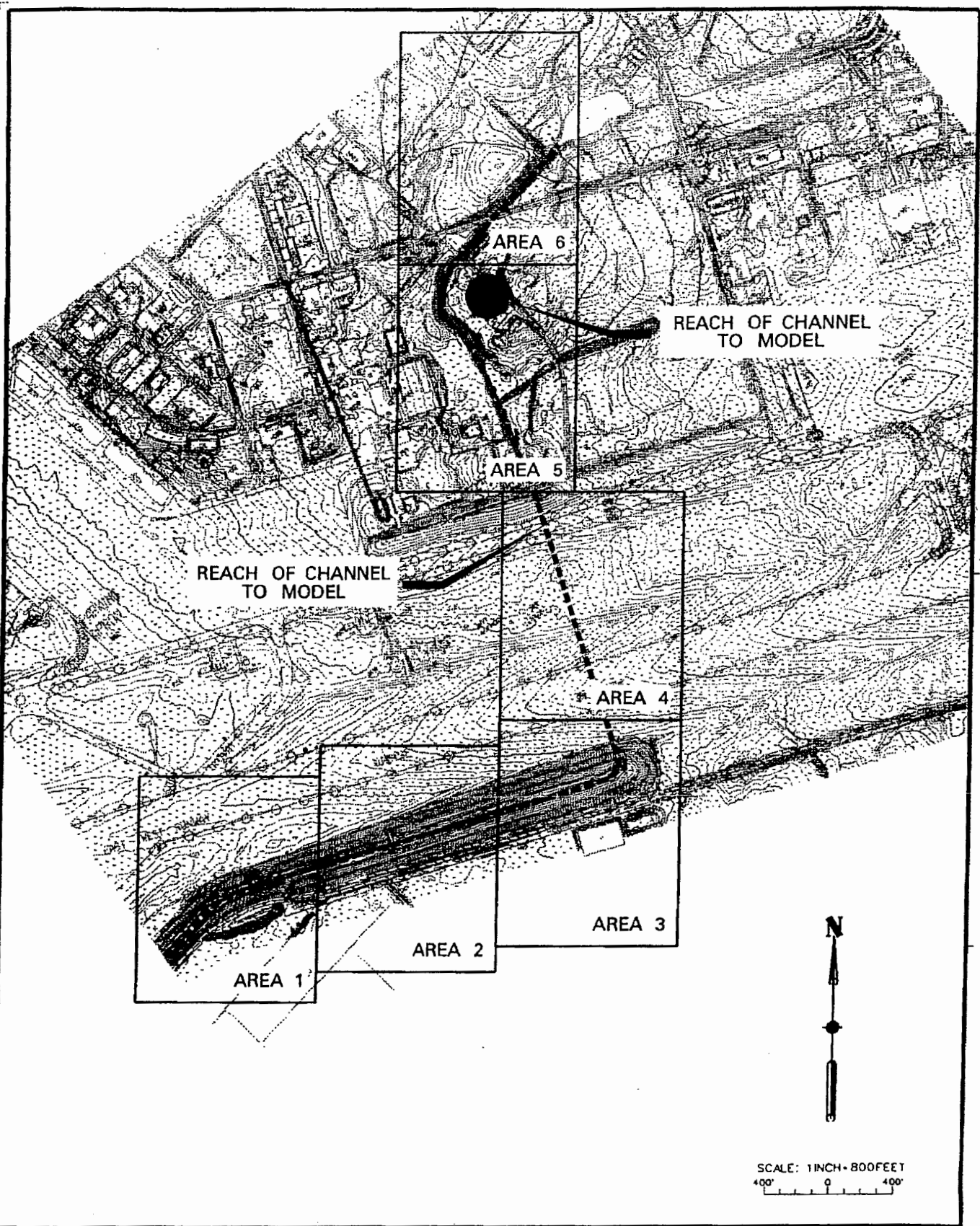
The drainage design has looked at the improvements needed in the proposed construction to meet the required guidelines. The treatment of the runoff, as provided by the infiltration trench, grass swales, detention basin and the payment of assessments, meet the requirements specified by the State of North Carolina for addressing storm water abatement.











SCALE: 1 INCH = 800 FEET  
 400' 0 400'

Designed By  
 G.S.L.  
 Drawn By  
 G.S.L.  
 Reviewed By  
 J.M.

Submitted by:  
 JEP Atty/Engineer  
 Section: W-00000133 Chel

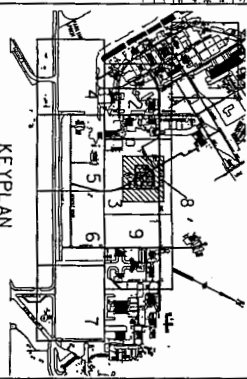
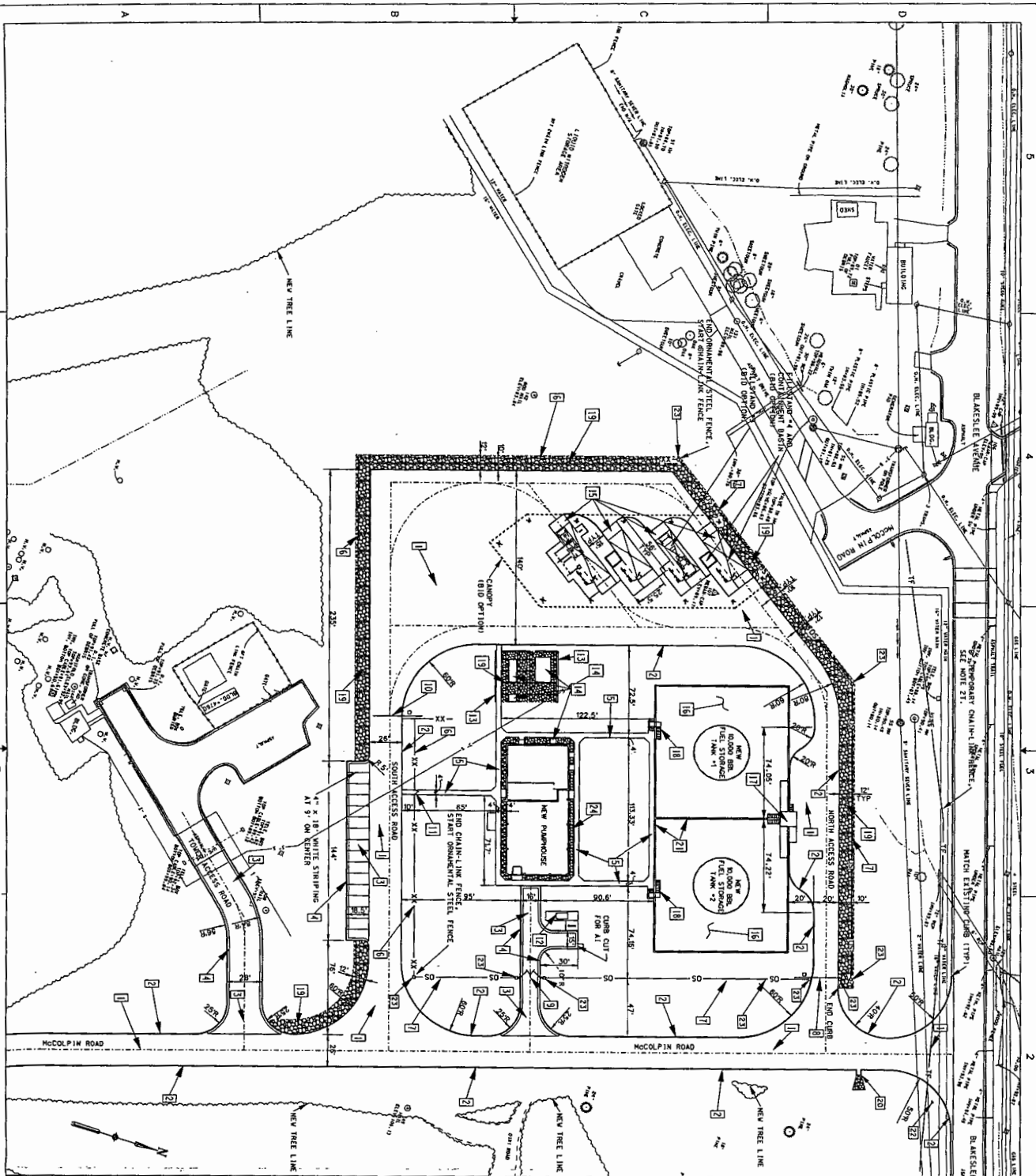
 **US Army Corps  
 of Engineers**  
 Omaha District

SEYMOUR JOHNSON AFB NORTH CAROLINA  
**ANALYSIS  
 OF  
 STORM SEWER EXTENSION**

**HEC RAS MODEL  
 LOCATION PLAN**

Date: JANUARY 2005  
 Computer File:  
 PLATE 1M.D00N  
 Plot Scale:  
 1" = 800'

Plate No.  
**1**



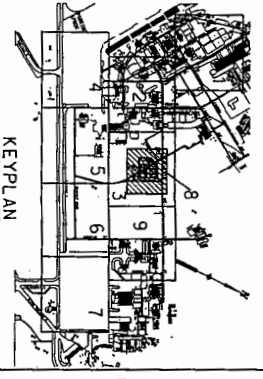
KEY PLAN  
NO SCALE

NOTES:

1. PC CONCRETE PAVEMENT, SEE SHT. C-9-01 FOR DETAILS
2. INTERIOR CURB, SEE SHT. C-9-01 FOR DETAILS
3. BITUMENS PAVEMENT, SEE SHT. C-9-01 FOR DETAILS
4. CONC. CURB & GUTTER, SEE SHT. C-9-01 FOR DETAILS
5. 4" CONCRETE SIDEWALK, SEE SHT. C-9-05 FOR DETAILS
6. CHAIN-LINK SECURITY FENCE, SEE SHT. C-9-10 FOR DETAILS
7. CHAIN-LINK FENCE, SEE SHT. C-9-09 FOR DETAILS
8. ORNAMENTAL STEEL SLIDE GATE, SEE SHT. C-9-09 FOR DETAILS
9. 18" ORNAMENTAL STEEL SLIDE GATE, SEE SHT. C-9-09 FOR DETAILS
10. 26" CHAIN-LINK SLIDE GATE, SEE SHT. C-9-11 FOR DETAILS
11. CHAIN-LINK PERSONNEL GATE, SEE SHT. C-9-11 FOR DETAILS
12. PERSONNEL RECOVERY TANK, SEE SHT. C-9-05 FOR DETAILS
13. SCREEN WALL, SEE SHT. A-5-02 FOR DETAILS
14. AST & EQUIPMENT PADS, SEE SHT. C-9-05 FOR DETAILS
15. FIL STAMPS, SEE SHEET C-9-03 FOR DETAILS
16. BLACK FUEL STORAGE TANK CONTAINMENT BASIN, SEE SHT. C-9-03 FOR DETAILS
17. LOADING DOCKS AND RAMP, SEE SHT. S-9-09 FOR DETAILS
18. STEEL STAIRWAY, SEE SHT. S-9-08 FOR DETAILS
19. 4" SET RIVER ROCK SURFACING 11" x 2 1/2" AGGREGATE SIZE PLACED OVER A LANDSCAPE AESTHETIC BARRIER
20. CONCRETE FLOOR AND RAMP, SEE SHT. C-9-06 FOR DETAILS
21. CONCRETE CONTAINMENT WALL, SEE SHT. S-9-07 FOR DETAILS
22. STONE SLOPE, SEE SHT. C-9-05 FOR DETAILS
23. MASONRY COLUMNS AT TERMINATION POINTS OF ORNAMENTAL STEEL FENCE, SEE SHT. C-9-09 FOR DETAILS
24. 4" DEEP LAVA ROCK SURFACE OVER A LANDSCAPE AESTHETIC BARRIER
25. SEE JOINT LAYOUT PLANS FOR ADDITIONAL PAVEMENT
26. ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.
27. ORNAMENTAL FENCE SHALL INCLUDE A VERTICAL BARBUTER OR CONSTRUCTION SHALL MAINTAIN THIS FENCE THROUGH OUT FILLSIDE 23 AND 24. FILLSIDE BID OPTION INCLUDE ASSOCIATED DRAINAGE SYSTEMS.

SCALE: 1"=20'-0"

NO.	DATE	DESCRIPTION	BY	CHKD.
1	11/11/00	DESIGN	W. J. JENSEN	
2	11/11/00	DESIGN	W. J. JENSEN	
3	11/11/00	DESIGN	W. J. JENSEN	
4	11/11/00	DESIGN	W. J. JENSEN	
5	11/11/00	DESIGN	W. J. JENSEN	
6	11/11/00	DESIGN	W. J. JENSEN	
7	11/11/00	DESIGN	W. J. JENSEN	
8	11/11/00	DESIGN	W. J. JENSEN	
9	11/11/00	DESIGN	W. J. JENSEN	
10	11/11/00	DESIGN	W. J. JENSEN	
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12	11/11/00	DESIGN	W. J. JENSEN	
13	11/11/00	DESIGN	W. J. JENSEN	
14	11/11/00	DESIGN	W. J. JENSEN	
15	11/11/00	DESIGN	W. J. JENSEN	
16	11/11/00	DESIGN	W. J. JENSEN	
17	11/11/00	DESIGN	W. J. JENSEN	
18	11/11/00	DESIGN	W. J. JENSEN	
19	11/11/00	DESIGN	W. J. JENSEN	
20	11/11/00	DESIGN	W. J. JENSEN	
21	11/11/00	DESIGN	W. J. JENSEN	
22	11/11/00	DESIGN	W. J. JENSEN	
23	11/11/00	DESIGN	W. J. JENSEN	
24	11/11/00	DESIGN	W. J. JENSEN	
25	11/11/00	DESIGN	W. J. JENSEN	
26	11/11/00	DESIGN	W. J. JENSEN	
27	11/11/00	DESIGN	W. J. JENSEN	
28	11/11/00	DESIGN	W. J. JENSEN	
29	11/11/00	DESIGN	W. J. JENSEN	
30	11/11/00	DESIGN	W. J. JENSEN	
31	11/11/00	DESIGN	W. J. JENSEN	
32	11/11/00	DESIGN	W. J. JENSEN	
33	11/11/00	DESIGN	W. J. JENSEN	
34	11/11/00	DESIGN	W. J. JENSEN	
35	11/11/00	DESIGN	W. J. JENSEN	
36	11/11/00	DESIGN	W. J. JENSEN	
37	11/11/00	DESIGN	W. J. JENSEN	
38	11/11/00	DESIGN	W. J. JENSEN	
39	11/11/00	DESIGN	W. J. JENSEN	
40	11/11/00	DESIGN	W. J. JENSEN	
41	11/11/00	DESIGN	W. J. JENSEN	
42	11/11/00	DESIGN	W. J. JENSEN	
43	11/11/00	DESIGN	W. J. JENSEN	
44	11/11/00	DESIGN	W. J. JENSEN	
45	11/11/00	DESIGN	W. J. JENSEN	
46	11/11/00	DESIGN	W. J. JENSEN	
47	11/11/00	DESIGN	W. J. JENSEN	
48	11/11/00	DESIGN	W. J. JENSEN	
49	11/11/00	DESIGN	W. J. JENSEN	
50	11/11/00	DESIGN	W. J. JENSEN	
51	11/11/00	DESIGN	W. J. JENSEN	
52	11/11/00	DESIGN	W. J. JENSEN	
53	11/11/00	DESIGN	W. J. JENSEN	
54	11/11/00	DESIGN	W. J. JENSEN	
55	11/11/00	DESIGN	W. J. JENSEN	
56	11/11/00	DESIGN	W. J. JENSEN	
57	11/11/00	DESIGN	W. J. JENSEN	
58	11/11/00	DESIGN	W. J. JENSEN	
59	11/11/00	DESIGN	W. J. JENSEN	
60	11/11/00	DESIGN	W. J. JENSEN	
61	11/11/00	DESIGN	W. J. JENSEN	
62	11/11/00	DESIGN	W. J. JENSEN	
63	11/11/00	DESIGN	W. J. JENSEN	
64	11/11/00	DESIGN	W. J. JENSEN	
65	11/11/00	DESIGN	W. J. JENSEN	
66	11/11/00	DESIGN	W. J. JENSEN	
67	11/11/00	DESIGN	W. J. JENSEN	
68	11/11/00	DESIGN	W. J. JENSEN	
69	11/11/00	DESIGN	W. J. JENSEN	
70	11/11/00	DESIGN	W. J. JENSEN	
71	11/11/00	DESIGN	W. J. JENSEN	
72	11/11/00	DESIGN	W. J. JENSEN	
73	11/11/00	DESIGN	W. J. JENSEN	
74	11/11/00	DESIGN	W. J. JENSEN	
75	11/11/00	DESIGN	W. J. JENSEN	
76	11/11/00	DESIGN	W. J. JENSEN	
77	11/11/00	DESIGN	W. J. JENSEN	
78	11/11/00	DESIGN	W. J. JENSEN	
79	11/11/00	DESIGN	W. J. JENSEN	
80	11/11/00	DESIGN	W. J. JENSEN	
81	11/11/00	DESIGN	W. J. JENSEN	
82	11/11/00	DESIGN	W. J. JENSEN	
83	11/11/00	DESIGN	W. J. JENSEN	
84	11/11/00	DESIGN	W. J. JENSEN	
85	11/11/00	DESIGN	W. J. JENSEN	
86	11/11/00	DESIGN	W. J. JENSEN	
87	11/11/00	DESIGN	W. J. JENSEN	
88	11/11/00	DESIGN	W. J. JENSEN	
89	11/11/00	DESIGN	W. J. JENSEN	
90	11/11/00	DESIGN	W. J. JENSEN	
91	11/11/00	DESIGN	W. J. JENSEN	
92	11/11/00	DESIGN	W. J. JENSEN	
93	11/11/00	DESIGN	W. J. JENSEN	
94	11/11/00	DESIGN	W. J. JENSEN	
95	11/11/00	DESIGN	W. J. JENSEN	
96	11/11/00	DESIGN	W. J. JENSEN	
97	11/11/00	DESIGN	W. J. JENSEN	
98	11/11/00	DESIGN	W. J. JENSEN	
99	11/11/00	DESIGN	W. J. JENSEN	
100	11/11/00	DESIGN	W. J. JENSEN	

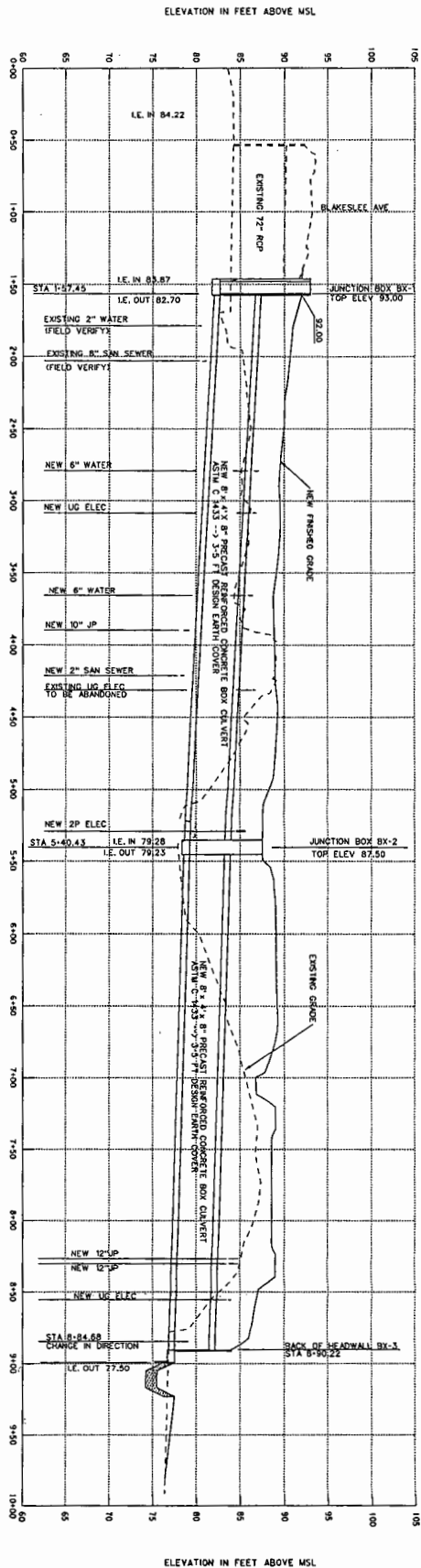


- NOTES:
1. SEE SHEET C-07-03 FOR ROOF DRAIN LINE AND COLLECTOR LINE DETAILS.
  2. ALL DRAINAGE AREAS SHALL BE TOP-SOLID AND SLOPED AS SPECIFIED.
  3. SEE JOINT PLANS FOR PAVEMENT SLOPE ELEVATIONS.
  4. SEE SHEET C-01-15 FOR A PLAN OF THE INFILTRATION BASIN SUBURBAN SYSTEM.
  5. SEE SHEET C-01-02 FOR ROAD PROFILES.
  6. SEE GRADING SECTIONS FOR FINISHED FLOOR ELEVATIONS.
  7. SO IF NON-PERFORATED AT FOUNDATION DRAIN LINE, SEE SHEET S-01-06 FOR ADDITIONAL INFORMATION.

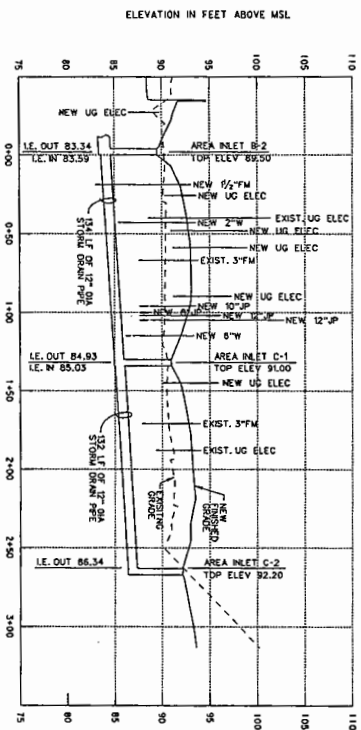
SCALE: 1"=40'-0" (VERT.)



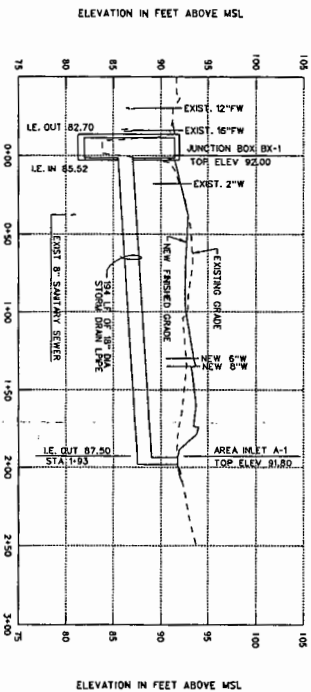
REVISION	DATE	BY	DESCRIPTION
1	12/15/08	W. J. WILSON	ISSUED FOR PERMIT
2	12/15/08	W. J. WILSON	ISSUED FOR PERMIT
3	12/15/08	W. J. WILSON	ISSUED FOR PERMIT
4	12/15/08	W. J. WILSON	ISSUED FOR PERMIT
5	12/15/08	W. J. WILSON	ISSUED FOR PERMIT
6	12/15/08	W. J. WILSON	ISSUED FOR PERMIT
7	12/15/08	W. J. WILSON	ISSUED FOR PERMIT
8	12/15/08	W. J. WILSON	ISSUED FOR PERMIT
9	12/15/08	W. J. WILSON	ISSUED FOR PERMIT
10	12/15/08	W. J. WILSON	ISSUED FOR PERMIT



STORM DRAIN LINE BX PROFILE  
SCALE: VERT. 1"=10' H. 1"=50' H. 1"=50' H.

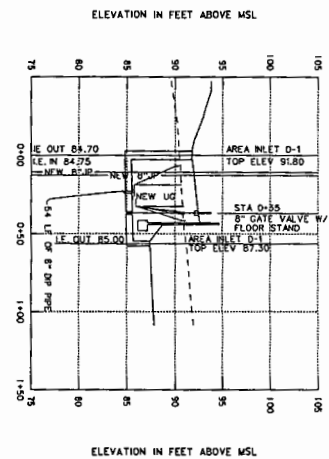


STORM DRAIN LINE C PROFILE  
SCALE: VERT. 1"=10' H. 1"=50' H. 1"=50' H.

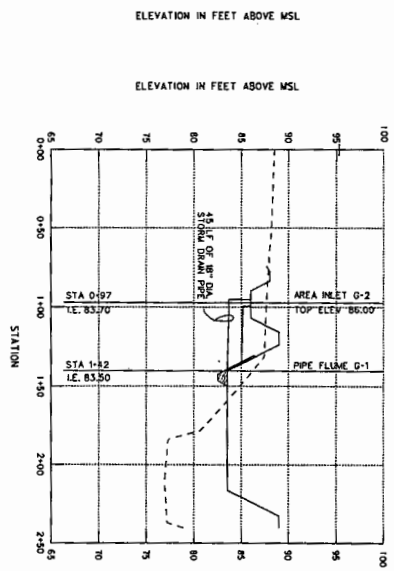


STORM DRAIN LINE A PROFILE  
SCALE: VERT. 1"=10' H. 1"=50' H. 1"=50' H.

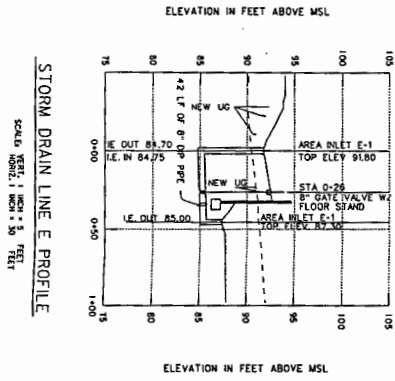
PROJECT INFORMATION		DESIGNER		CLIENT	
NO.	DATE	BY	CHKD.	BY	CHKD.
1	10/1/00	J. L. DUBOIS		U.S. ARMY CORPS OF ENGINEERS	
2	10/1/00	J. L. DUBOIS		U.S. ARMY CORPS OF ENGINEERS	
3	10/1/00	J. L. DUBOIS		U.S. ARMY CORPS OF ENGINEERS	
4	10/1/00	J. L. DUBOIS		U.S. ARMY CORPS OF ENGINEERS	
5	10/1/00	J. L. DUBOIS		U.S. ARMY CORPS OF ENGINEERS	
6	10/1/00	J. L. DUBOIS		U.S. ARMY CORPS OF ENGINEERS	
7	10/1/00	J. L. DUBOIS		U.S. ARMY CORPS OF ENGINEERS	
8	10/1/00	J. L. DUBOIS		U.S. ARMY CORPS OF ENGINEERS	
9	10/1/00	J. L. DUBOIS		U.S. ARMY CORPS OF ENGINEERS	
10	10/1/00	J. L. DUBOIS		U.S. ARMY CORPS OF ENGINEERS	



# STORM DRAIN LINE D PROFILE

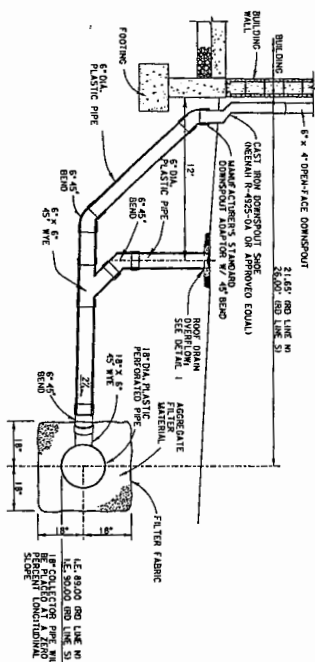


### STORM DRAIN LINE G PROFILE



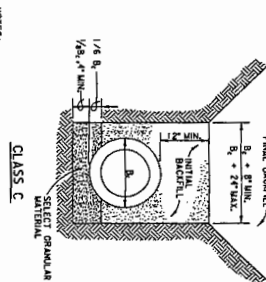
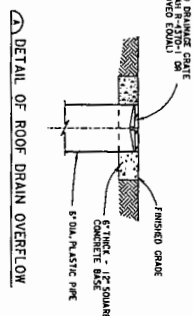
SCALE: VERT. 1 INCH = 5 FEET  
HORIZ. 1 INCH = 30 FEET

[illegible]



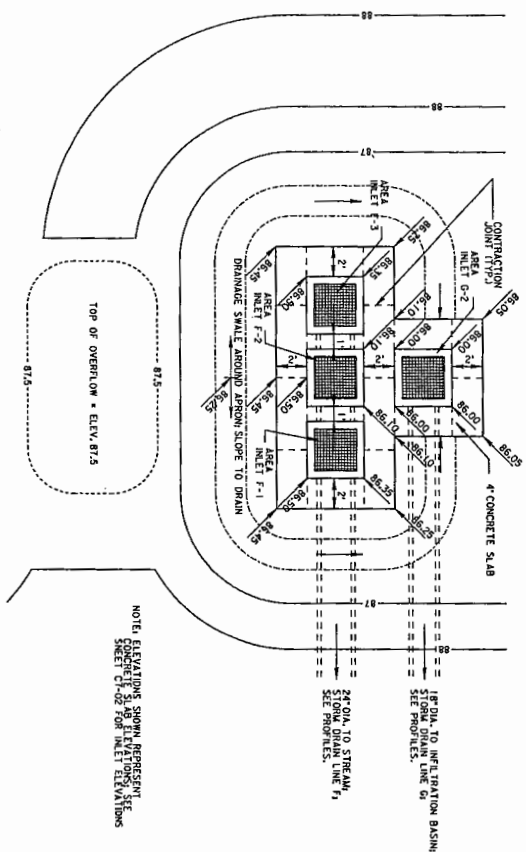
TYPICAL ROOF DRAIN LINE PROFILE  
NO SCALE

NOTE: SEE SPEC SECTION FOR AGGREGATE PIPE, FILTER FABRIC AND AGGREGATE FILTER MATERIAL REQUIREMENTS.



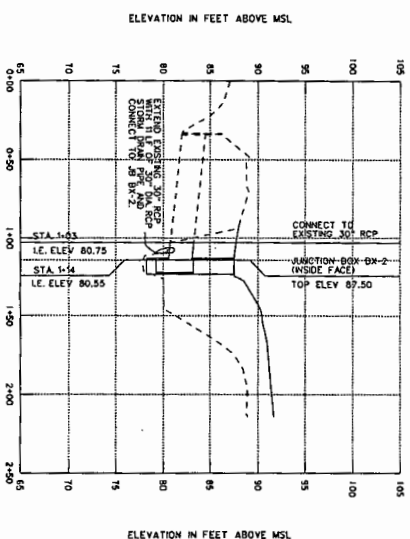
NOTES:  
1. SEE SPECIFICATIONS FOR MATERIAL AND CONNECTION REQUIREMENTS.  
2. PLASTIC PIPE OR COATED OR GALVANIZED PIPE AND 1/2\"/>

PIPE BEDDING DETAILS  
NO SCALE



PLAN OF INFILTRATION CONTROL STRUCTURE  
SCALE: 1 INCH = 5 FEET

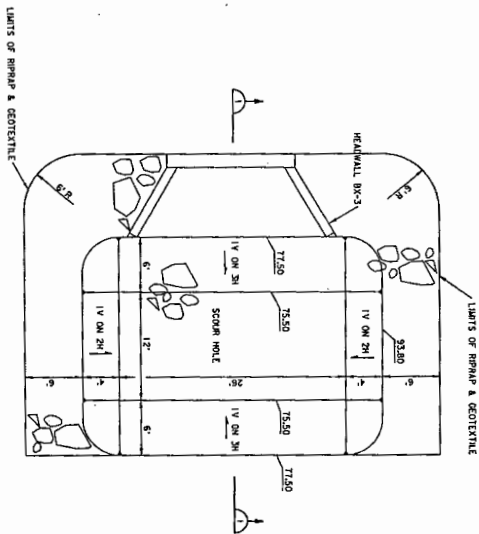
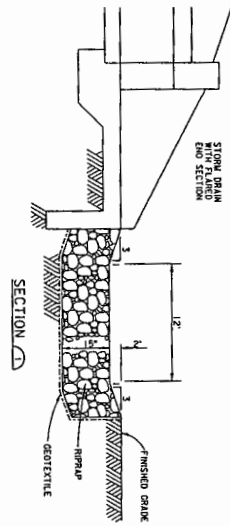
NOTE: ELEVATIONS SHOWN REPRESENT CONCRETE SLAB ELEVATIONS. SEE SHEET C-102 FOR INLET ELEVATIONS.



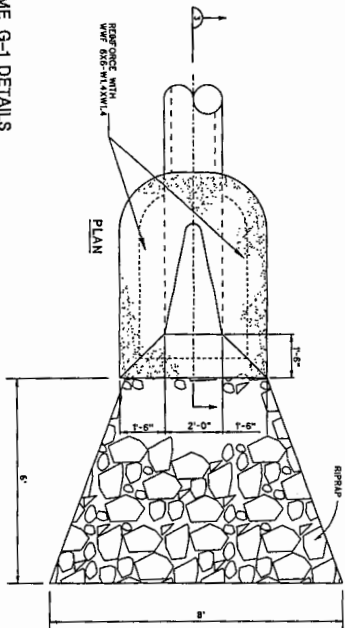
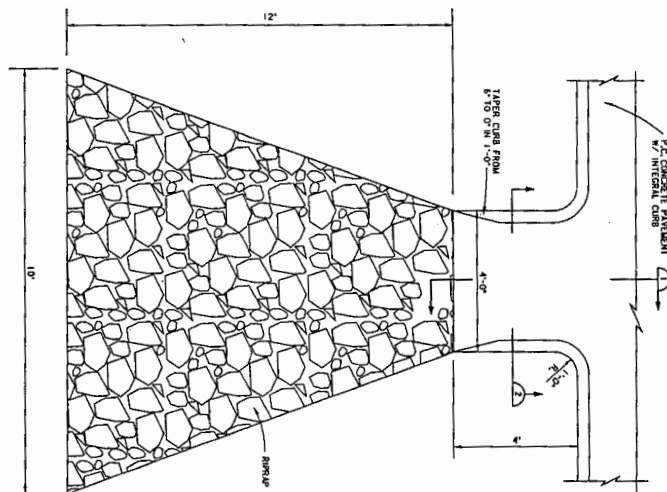
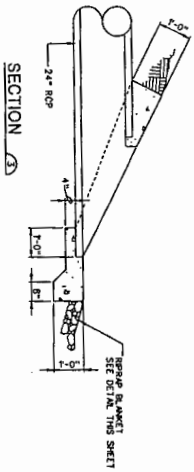
STORM DRAIN LINE H PROFILE  
SCALE: HORIZ. 1 INCH = 5 FEET  
VERT. 1 INCH = 5 FEET

REVISION	DATE	BY	CHKD	APP'D	DESCRIPTION
1	10/1/88	J. A. VANCE			DESIGN
2	10/1/88	J. A. VANCE			REVISION
3	10/1/88	J. A. VANCE			REVISION
4	10/1/88	J. A. VANCE			REVISION
5	10/1/88	J. A. VANCE			REVISION
6	10/1/88	J. A. VANCE			REVISION
7	10/1/88	J. A. VANCE			REVISION
8	10/1/88	J. A. VANCE			REVISION
9	10/1/88	J. A. VANCE			REVISION
10	10/1/88	J. A. VANCE			REVISION

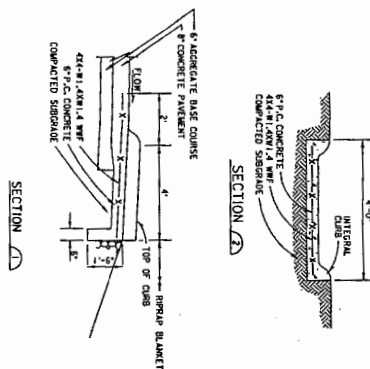
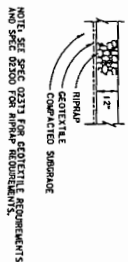
REVISION	DATE	BY	CHKD	APP'D	DESCRIPTION
1	10/1/88	J. A. VANCE			DESIGN
2	10/1/88	J. A. VANCE			REVISION
3	10/1/88	J. A. VANCE			REVISION
4	10/1/88	J. A. VANCE			REVISION
5	10/1/88	J. A. VANCE			REVISION
6	10/1/88	J. A. VANCE			REVISION
7	10/1/88	J. A. VANCE			REVISION
8	10/1/88	J. A. VANCE			REVISION
9	10/1/88	J. A. VANCE			REVISION
10	10/1/88	J. A. VANCE			REVISION



BOX CULVERT OUTFALL  
PREFORMED SCOUR HOLE DETAILS  
NO SCALE



TYPICAL RIPPRAP BLANKET SECTION  
NO SCALE



REVISION	DATE	BY	CHKD	APP'D
1	10/1/88	J. L. GIBSON		
2	10/1/88	J. L. GIBSON		
3	10/1/88	J. L. GIBSON		
4	10/1/88	J. L. GIBSON		
5	10/1/88	J. L. GIBSON		
6	10/1/88	J. L. GIBSON		
7	10/1/88	J. L. GIBSON		
8	10/1/88	J. L. GIBSON		
9	10/1/88	J. L. GIBSON		
10	10/1/88	J. L. GIBSON		

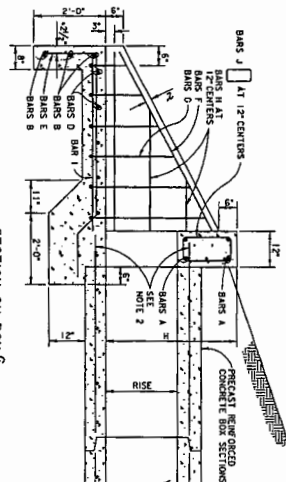
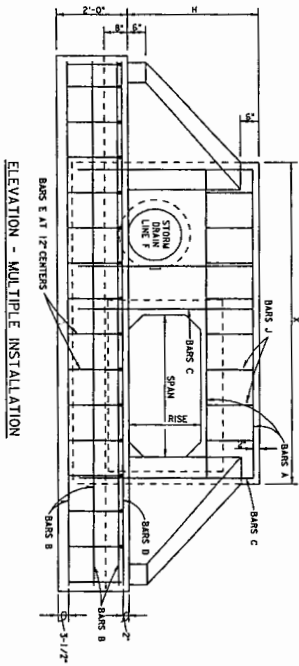
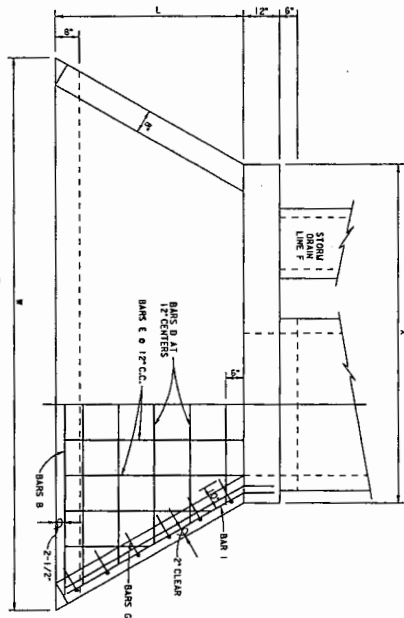
NOTE: SEE SPEC. FOR GEOTEXTILE REQUIREMENTS AND SPEC. FOR RIPPRAP REQUIREMENTS.

U.S. ARMY CORPS OF ENGINEERS  
WATERWAYS DIVISION  
Vicksburg, Mississippi

DESIGNED BY: J. L. GIBSON  
CHECKED BY: J. L. GIBSON  
APPROVED BY: J. L. GIBSON

PROJECT NO. 10/1/88  
SHEET NO. 10/1/88

PIPE FLUME G-1 DETAILS  
NO SCALE



BOX CULVERT HEADWALL DETAILS  
NO SCALE

TABLE OF VARIABLE DIMENSIONS

BOX SIZE NO. OF BOXES	SPAN NO.	RISE NO.	BAR 1 NO.	BAR 2 NO.	BAR 3 NO.	BAR 4 NO.	BAR 5 NO.	BAR 6 NO.	BAR 7 NO.	BAR 8 NO.
1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13	13	13	13
14	14	14	14	14	14	14	14	14	14	14
15	15	15	15	15	15	15	15	15	15	15
16	16	16	16	16	16	16	16	16	16	16
17	17	17	17	17	17	17	17	17	17	17
18	18	18	18	18	18	18	18	18	18	18
19	19	19	19	19	19	19	19	19	19	19
20	20	20	20	20	20	20	20	20	20	20

\* MINIMUM CLEARANCE TO A MINIMUM OF 3" IF TRENCHES.

GENERAL NOTES:  
1. REINFORCING STEEL, FT = 60 KSI.  
2. REMOVE 12" OF CONCRETE FROM BOX CULVERT TO EXPOSE  
REINFORCEMENT TO PREPARE FOR 12" MINIMUM HEADWALL.

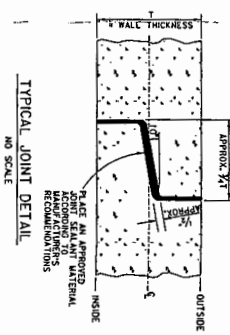
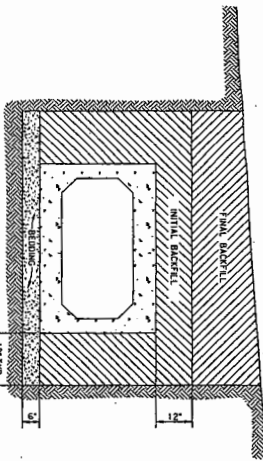
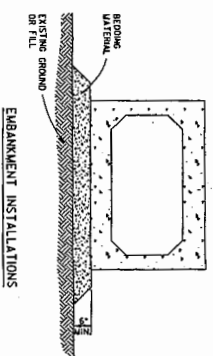


TABLE OF VARIABLE DIMENSIONS

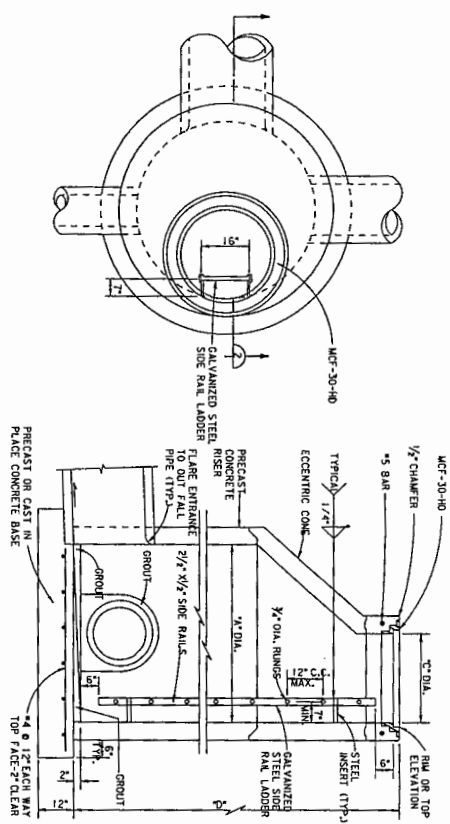
BOX SIZE NO. OF BOXES	SPAN NO.	RISE NO.	BAR 1 NO.	BAR 2 NO.	BAR 3 NO.	BAR 4 NO.	BAR 5 NO.	BAR 6 NO.	BAR 7 NO.	BAR 8 NO.
1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13	13	13	13
14	14	14	14	14	14	14	14	14	14	14
15	15	15	15	15	15	15	15	15	15	15
16	16	16	16	16	16	16	16	16	16	16
17	17	17	17	17	17	17	17	17	17	17
18	18	18	18	18	18	18	18	18	18	18
19	19	19	19	19	19	19	19	19	19	19
20	20	20	20	20	20	20	20	20	20	20

GENERAL NOTES:  
1. REINFORCING STEEL, FT = 60 KSI.  
2. REMOVE 12" OF CONCRETE FROM BOX CULVERT TO EXPOSE  
REINFORCEMENT TO PREPARE FOR 12" MINIMUM HEADWALL.

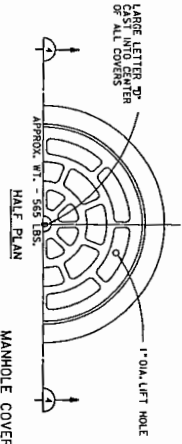
GENERAL NOTES:  
1. REINFORCING STEEL, FT = 60 KSI.  
2. REMOVE 12" OF CONCRETE FROM BOX CULVERT TO EXPOSE  
REINFORCEMENT TO PREPARE FOR 12" MINIMUM HEADWALL.

GENERAL NOTES:  
1. REINFORCING STEEL, FT = 60 KSI.  
2. REMOVE 12" OF CONCRETE FROM BOX CULVERT TO EXPOSE  
REINFORCEMENT TO PREPARE FOR 12" MINIMUM HEADWALL.

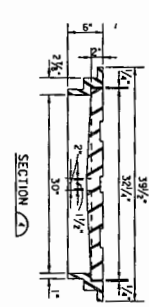
GENERAL NOTES:  
1. REINFORCING STEEL, FT = 60 KSI.  
2. REMOVE 12" OF CONCRETE FROM BOX CULVERT TO EXPOSE  
REINFORCEMENT TO PREPARE FOR 12" MINIMUM HEADWALL.



PLAN  
TYPICAL PRECAST ECCENTRIC MANHOLE DETAILS  
NO SCALE



HALF PLAN  
MANHOLE COVER & FRAME  
MCF-30-HD  
NO SCALE

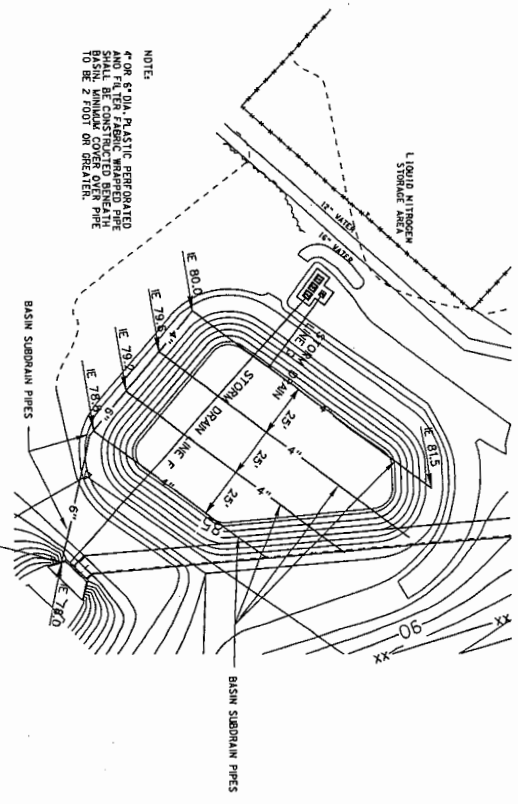


SECTION A-A

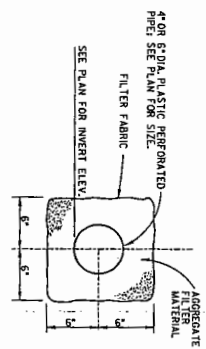
NOTES:

1. VARIATIONS DIMENSIONS (A, B, C, D) FOR STRUCTURES ARE
2. PRECAST CONCRETE MANHOLE STRUCTURES ARE CAST INTO CENTER OF ALL COVERS
3. PRECAST CONCRETE MANHOLE STRUCTURES ARE CAST INTO CENTER OF ALL COVERS
4. PRECAST CONCRETE MANHOLE STRUCTURES ARE CAST INTO CENTER OF ALL COVERS
5. PRECAST CONCRETE MANHOLE STRUCTURES ARE CAST INTO CENTER OF ALL COVERS
6. PRECAST CONCRETE MANHOLE STRUCTURES ARE CAST INTO CENTER OF ALL COVERS
7. PRECAST CONCRETE MANHOLE STRUCTURES ARE CAST INTO CENTER OF ALL COVERS

STRUCTURE	DIMENSIONS IN FEET				REMARKS
	A	B	C	D	
MAN B-1	4.0	2.5	5.0	2.5	MANHOLE SEE SHEET CS-15
MAN B-2	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-16
MAN B-3	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-17
MAN B-4	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-18
MAN B-5	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-19
MAN B-6	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-20
MAN B-7	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-21
MAN B-8	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-22
MAN B-9	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-23
MAN B-10	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-24
MAN B-11	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-25
MAN B-12	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-26
MAN B-13	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-27
MAN B-14	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-28
MAN B-15	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-29
MAN B-16	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-30
MAN B-17	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-31
MAN B-18	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-32
MAN B-19	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-33
MAN B-20	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-34
MAN B-21	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-35
MAN B-22	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-36
MAN B-23	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-37
MAN B-24	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-38
MAN B-25	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-39
MAN B-26	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-40
MAN B-27	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-41
MAN B-28	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-42
MAN B-29	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-43
MAN B-30	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-44
MAN B-31	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-45
MAN B-32	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-46
MAN B-33	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-47
MAN B-34	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-48
MAN B-35	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-49
MAN B-36	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-50



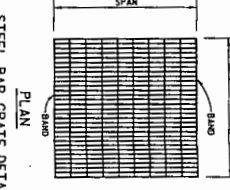
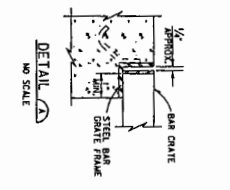
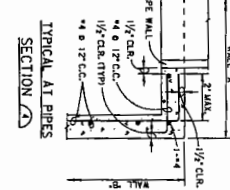
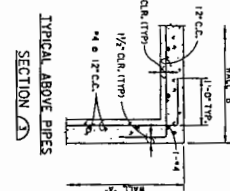
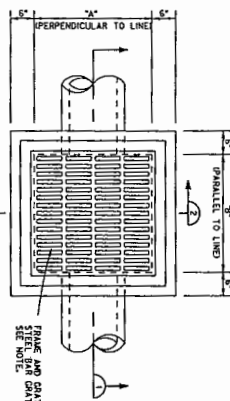
INFILTRATION BASIN PLAN  
SCALE 1" = 20'



TYPICAL SUBRAIN LINE SECTION  
NO SCALE

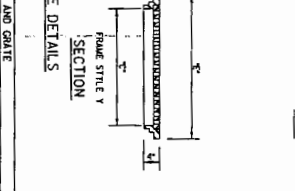
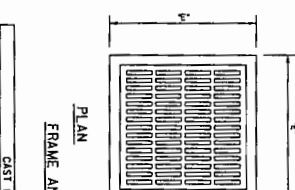
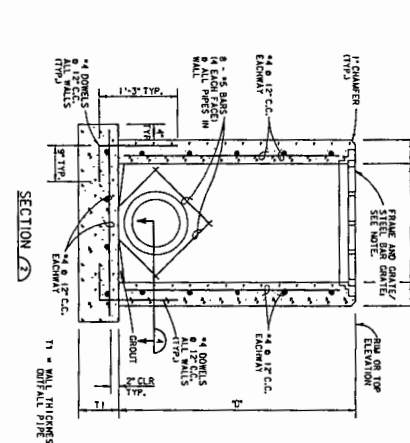
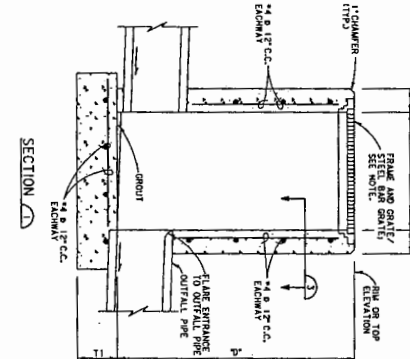
BASIN SUBRAIN LINE DETAILS

STRUCTURE	DIMENSIONS IN FEET				REMARKS
	A	B	C	D	
MAN B-1	4.0	2.5	5.0	2.5	MANHOLE SEE SHEET CS-15
MAN B-2	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-16
MAN B-3	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-17
MAN B-4	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-18
MAN B-5	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-19
MAN B-6	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-20
MAN B-7	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-21
MAN B-8	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-22
MAN B-9	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-23
MAN B-10	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-24
MAN B-11	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-25
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MAN B-14	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-28
MAN B-15	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-29
MAN B-16	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-30
MAN B-17	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-31
MAN B-18	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-32
MAN B-19	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-33
MAN B-20	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-34
MAN B-21	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-35
MAN B-22	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-36
MAN B-23	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-37
MAN B-24	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-38
MAN B-25	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-39
MAN B-26	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-40
MAN B-27	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-41
MAN B-28	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-42
MAN B-29	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-43
MAN B-30	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-44
MAN B-31	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-45
MAN B-32	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-46
MAN B-33	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-47
MAN B-34	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-48
MAN B-35	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-49
MAN B-36	2.5	2.5	2.5	2.5	MANHOLE SEE SHEET CS-50



STEEL BAR GRATE AND FRAME			
A	B	C	D
SPAN	WIDTH	RESISTANCE	FRAME
12'-0"	5'-0"	12'-0"	5'-0"

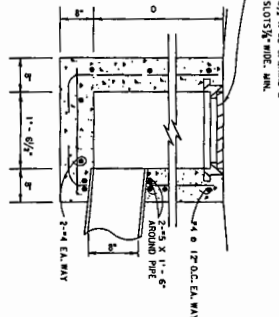
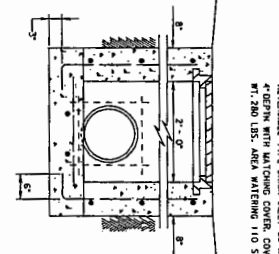
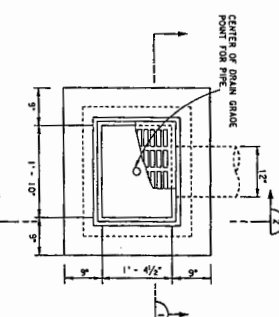
1. BAR GRATING SHALL BE GALVANIZED STEEL. PERMS LOCKED GRATING MAY BE USED IN LIEU OF PERMS. NOTES SHALL BE GALVANIZED STEEL WELLS.



CISTERN FRAME AND GRATE			
A	B	C	D
SPAN	WIDTH	RESISTANCE	FRAME
12'-0"	5'-0"	12'-0"	5'-0"

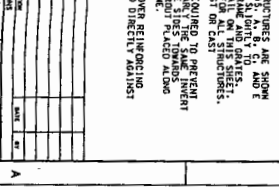
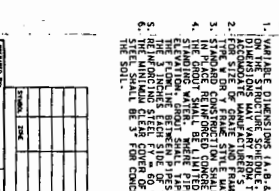
1. BAR GRATING SHALL BE GALVANIZED STEEL. PERMS LOCKED GRATING MAY BE USED IN LIEU OF PERMS. NOTES SHALL BE GALVANIZED STEEL WELLS.

TYPE "A" AREA INLET DETAILS  
NO SCALE



REVERSIBLE TYPE DRAIN INLET 25" X 31" FRAME, 18 1/2" X 22" OPENING & 4" DEPTH WITH WATERTIGHT COVER, COVER TO HAVE 5.015X WIDE, 4IN. 11" X 28" LBS. AREA WATERING 110 SQ. IN.

TYPE "C" AREA INLET DETAILS  
NO SCALE



REVERSIBLE TYPE DRAIN INLET 25" X 31" FRAME, 18 1/2" X 22" OPENING & 4" DEPTH WITH WATERTIGHT COVER, COVER TO HAVE 5.015X WIDE, 4IN. 11" X 28" LBS. AREA WATERING 110 SQ. IN.

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July 28, 2005

Lt. Col. Lowell A. Nelson  
 Commander, 4<sup>th</sup> Civil Engineer Squadron  
 1095 Peterson Avenue  
 Seymour Johnson AFB NC 27531-2355

Project: Seymour Johnson AFB, Expansion of Support Facilities County: Wayne

The purpose of this letter is to notify you that the North Carolina Ecosystem Enhancement Program (NC EEP) is willing to accept payment for impacts associated with the above referenced project. Please note that this decision does not assure that the payment will be approved by the permit issuing agencies as mitigation for project impacts. It is the responsibility of the applicant to contact these agencies to determine if payment to the NC EEP will be approved.

This acceptance is valid for six months from the date of this letter. If we have not received a copy of the issued 404 Permit/401 Certification within this time frame, this acceptance will expire. It is the applicant's responsibility to send copies of the 404/401/CAMA permits to NC EEP. Once NC EEP receives a copy of the 404 Permit and/or the 401 Certification an invoice will be issued and payment must be made.

Based on the information supplied by you the impacts that may require compensatory mitigation are summarized in the following table.

River Basin Cataloging Unit	Wetlands (Acres)			Stream (Linear Feet)			Buffer Zone 1 (Sq. Ft.)	Buffer Zone 2 (Sq. Ft.)
	Riparian	Non-Riparian	Coastal Marsh	Cold	Cool	Warm		
Neuse 03020202	0	0	0	0	0	3,085	186,643	118,952

Upon receipt of payment, EEP will take responsibility for providing the compensatory mitigation for the permitted impacts up to a 2:1 ratio, (buffers, Zone 1 at a 3:1 ratio and Zone 2 at a 1.5:1 ratio). The type and amount of the compensatory mitigation will be as specified in the Section 404 Permit and/or 401 Water Quality Certification, and/or CAMA Permit. The mitigation will be performed in accordance with the Memorandum of Understanding between the N. C. Department of Environment and Natural Resources and the U. S. Army Corps of Engineers dated November 4, 1998.

If you have any questions or need additional information, please contact Carol Shaw at (919) 733-5205.

Sincerely,

*James B. Stedhill for*  
 William D. Gilmore, PE  
 Director

cc: Cyndi Karoly, Wetlands/401 Unit  
 Scott Jones, USACOE - Washington  
 Kyle Barnes, DWQ Regional Office - Washington  
 File

*Restoring... Enhancing... Protecting Our State*





DEPARTMENT OF THE AIR FORCE

4TH FIGHTER WING (ACD)  
SEYMOUR JOHNSON AIR FORCE BASE NC

Lt Col Lowell A. Nelson  
Commander, 4th Civil Engineer Squadron  
1095 Peterson Avenue  
Seymour Johnson AFB NC 27531-2355

JUN 30 2005

Mr. Jeff Jurek  
NC DENR  
Ecosystem Enhancement Program  
1619 Mail Service Center  
Raleigh, NC 27699-1619

Ref: Seymour Johnson AFB, Expansion of Support Facilities, Wayne County NC

Dear Mr. Jurek

Seymour Johnson AFB submitted a request to your office on 20 Jan 04 to completely culvert approximately 3,220 linear feet of a tributary stream to the Neuse River Basin in support of a mission-essential facility project. As a result of this required action, SJAFB requested to offset the stream, stream buffer, and wetland impacts by payment into the NC Ecosystem Enhancement Program's NCEEP mitigation fund.

On 17 Feb 04, your office responded to our request outlining the necessary steps that must be taken prior to approval. In accordance with your guidance, we have contacted the US Army Corps of Engineers and the NC Division of Water Quality/401 Unit, and have received approval from these agencies that payment into the NCEEP for impacts associated with this project is appropriate. Furthermore, upon consultation with your office, we were informed that the NCEEP could accept full payment into the fund versus the partial payment previously noted.

According to GPS survey data performed by the Air Force, actual impacts to be mitigated are as follows:

Resource	Calculated Impacts*	Mitigation Ratio	Needed Mitigation Acceptance
Total Stream Length	3,085 feet	1 : 2	6,170 feet
Wetland	0.008 acres	N/A**	N/A**
Zone 1 buffer (30 feet)	186,643 sq ft	1 : 3	559,929 sq ft
Zone 2 buffer (additional 20 feet)	118,952 sq ft	1 : 1.5	178,428 sq ft
Total Mitigation Max requested			738,357 sq ft

\* - Buffer areas were calculated from the edge of stream bank. Stream width varies from approximately 5 to 8 feet.

\*\* - CoE has determined that no mitigation will be required.

*Global Power For America*

F

A conservative estimate of potential stream and riparian buffer impacts was calculated during the Environmental Assessment phase of the project. This methodology included a GPS stream and wetland delineation (completed in 2003) and data points at each turn in the stream with data for top of stream bank at each point. The stream information was input into ArcView and was used to calculate the total approximate stream length. A series of buffers were then applied over the stream length. The 30-foot buffer included all the area inside the 30-foot buffer lines, including impervious areas and stream surface water. The 20-foot buffer included all area between the 20-foot and 30-foot buffer lines including impervious surfaces.

For our permit application (and for this request), the GPS points were connected into a single polygon line in ArcView. Stream areas culverted under McColpin Road were excluded from stream length and buffer calculations. Surface water area (from top of bank to top of bank) was excluded in the 30-foot buffer calculation. This new calculation provides a more accurate estimation of the impact area requiring mitigation than reported in the April 2004 Environmental Assessment and the impacts requested for mitigation acceptance in our letter of 20 Jan 04.

Since the original acceptance letter from your office has expired, we are requesting that you review this submittal and provide this office with a valid letter of acceptance. The mitigation will be performed in accordance with the Memorandum of Understanding between the NCDENR and the USACOE dated 4 Nov 98.

F

Mr. Bryan Henderson of my Environmental Flight will be coordinating these efforts with the appropriate agencies. He may be reached at (919) 722-7440. I appreciate your assistance and continued support.

Sincerely



LOWELL A. NELSON, Lt Col, USAF

Attachments:

1. NCDENR Acceptance Letter, February 17, 2004
2. Project Map

cc:

US Army Corps of Engineers, Mr. Scott Jones  
NCDENR, DWQ Regional Office - Washington, Mr. Tom Steffens

The 15 x 11  
RECEIVED

MAR 0 2004

## North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary

February 17, 2004

*Corrected*

Lt. Col. Michael J. Coats  
Commander, 4<sup>th</sup> Civil Engineer Squadron  
1095 Peterson Avenue  
Seymour Johnson Air Force Base, NC 27531

Subject: Project: Seymour Johnson Air Force Base, Expansion of support facilities  
County: Wayne

The purpose of this letter is to notify you that the North Carolina Ecosystem Enhancement Program (NCEEP) is willing to accept payment for stream, wetlands and buffer impacts associated with the subject project. Please note that the decision by the NCEEP to accept the mitigation requirements of this project does not assure that this payment will be approved by the U.S. Army Corps of Engineers and the N.C. Division of Water Quality Wetlands/401 Unit. It is the responsibility of the applicant to contact these agencies to determine if payment to the NCEEP for impacts associated with this project is appropriate.

This acceptance is valid for six months from the date of this letter. **If we have not received a copy of the issued 404 Permit/401 Certification within this time frame, this acceptance will expire.**

Based on the information supplied by you in a letter dated January 20, 2004, the stream and wetlands restoration that is necessary to satisfy the compensatory mitigation requirements for this project is summarized in the following table. The maximum amount of mitigation that the NCEEP will accept for this project is also indicated in this table.

	Stream (linear feet)	Wetlands Riparian (acres)	Wetlands Non- Riparian (acres)	Riparian Buffer (sq. ft.)
Impact	3220		.008	348,480
Mitigation Max	6440		.016	696,960

The stream, non-riparian wetlands and buffer mitigation will be provided as specified in the 401 Water Quality Certification and/or Section 404 Permit for impacts associated with the subject project in Cataloging Unit 03020201 of the Neuse River Basin. The mitigation will be performed in accordance with the Memorandum of Understanding between the N.C. Department of Environment and Natural Resources and the U.S. Army Corps of Engineers dated November 4, 1998.

If you have any questions or need additional information, please contact Carol Shaw at (919) 733-5208.

Sincerely,

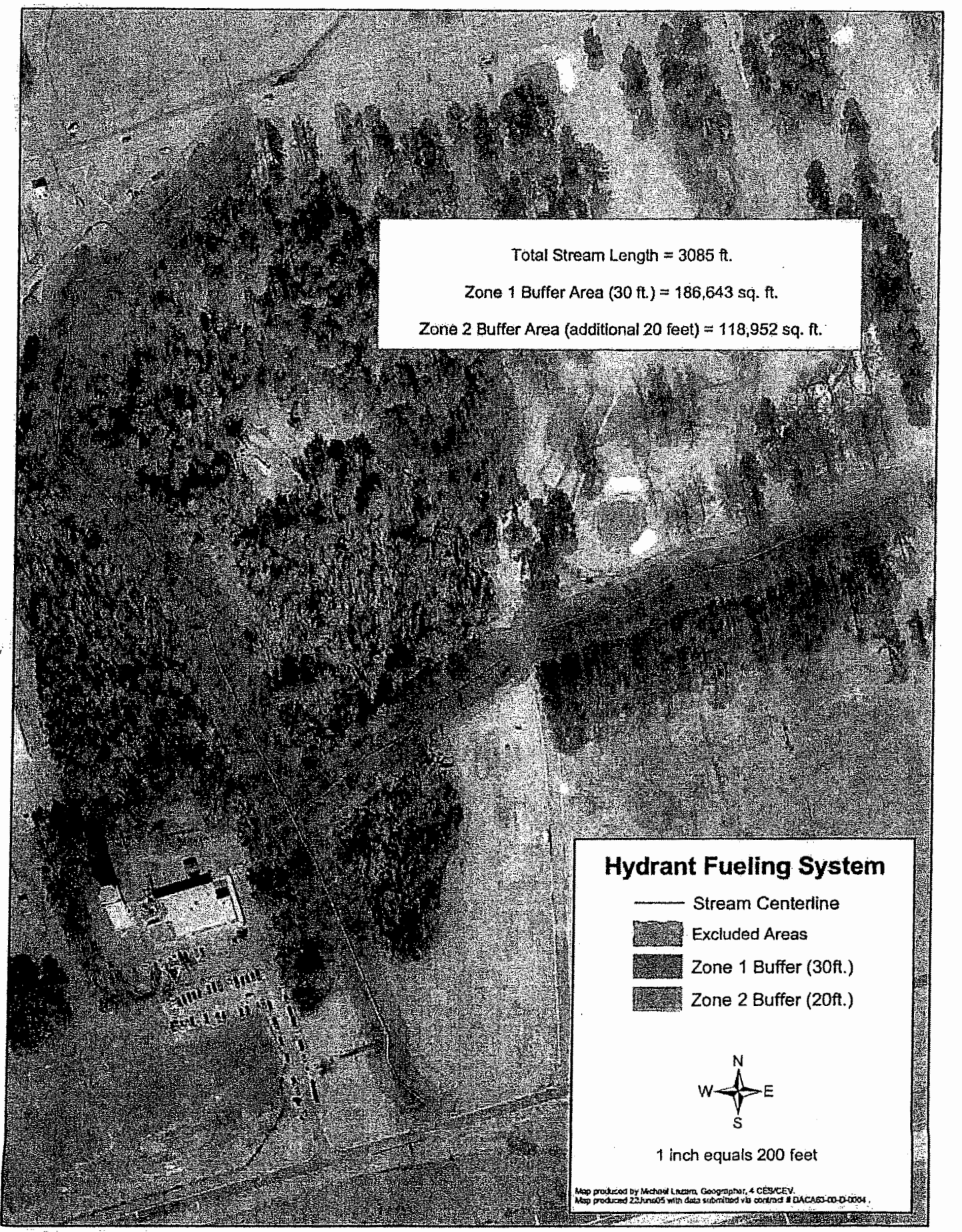
Ronald E. Ferrell,  
Director of Operations

cc: Cyndi Karoly, Wetlands/401 Unit  
Scott Jones, USACOE-Washington  
Tom Steffens, DWQ Regional Office-Washington  
File

NC DENR Ecosystem Enhancement Program  
1619 Mail Service Center, Raleigh, North Carolina 27699-1619  
Phone: 919-733-5208 FAX: 919-733-5321 Internet: h2o.enr.state.nc.us/wrp

One  
North Carolina  
*Naturally*

Atch 1







Total Stream Length = 3085 ft.

Zone 1 Buffer Area (30 ft.) = 186,643 sq. ft.

Zone 2 Buffer Area (additional 20 feet) = 118,952 sq. ft.

### Hydrant Fueling System

-  Stream Centerline
-  Excluded Areas
-  Zone 1 Buffer (30ft.)
-  Zone 2 Buffer (20ft.)



1 inch equals 200 feet

Map produced by Michael Luzum, Geographer, 4 CES/CEV.  
Map produced 22 June 05 with data submitted via contract # DACW63-00-D-0004.



## DEPARTMENT OF THE AIR FORCE

4TH FIGHTER WING (ACC)  
SEYMOUR JOHNSON AIR FORCE BASE NC

JAN 20 2004

Lt Col Michael J. Coats  
Commander, 4th Civil Engineer Squadron  
1095 Peterson Avenue  
Seymour Johnson AFB NC 27531-2355

Mr. Jeff Jurek  
NC DENR  
Wetlands Restoration Program  
1619 Mail Service Center  
Raleigh, NC 27699-1619

Dear Mr. Jurek

Seymour Johnson AFB is proposing the development of land adjacent to the base flight line. A tributary to the Neuse River is located in this area. It is proposed to completely culvert this stream at a length of 3,220 linear feet and fill the area. The Neuse River Buffer Regulations (15 NCAC 2B .0233) and Section 404 and 401 of the Clean Water Act apply to this stream. The US Air Force proposes to mitigate for impacts to the stream, stream buffer, and wetland area by paying in the available mitigation fund (North Carolina Wetlands Restoration Program).

The study area is on Seymour Johnson AFB in Wayne County, North Carolina, Middle Neuse Watershed, Catalog Number 03020202. According to GPS survey data, impacts to be mitigated are as follows:

Resource	Calculated Impacts*	Figure
Stream (forested)	2198 linear feet	1
Stream (channelized)	1022 linear feet	2, 3, 4
Wetland	0.008 acres	5
30 foot forested buffer	3.6 acres	1, 6
30 foot maintained buffer	1.7 acres	2, 3, 4
50 foot forested buffer	1.9 acres	1, 6
50 foot maintained buffer	0.8 acres	2, 3, 4

\* - Buffer areas were calculated from the edge of stream bank. Stream width is approximately 5 to 8 feet.

*Global Power For America*

The United States Air Force formally requests approval to pay into the Wetland Restoration Fund to accomplish the necessary mitigation required for the proposed project. This EA is being accomplished in coordination with the US Army Corp of Engineers and North Carolina Department of Environmental and Natural Resources, Division of Water Quality.

Sincerely



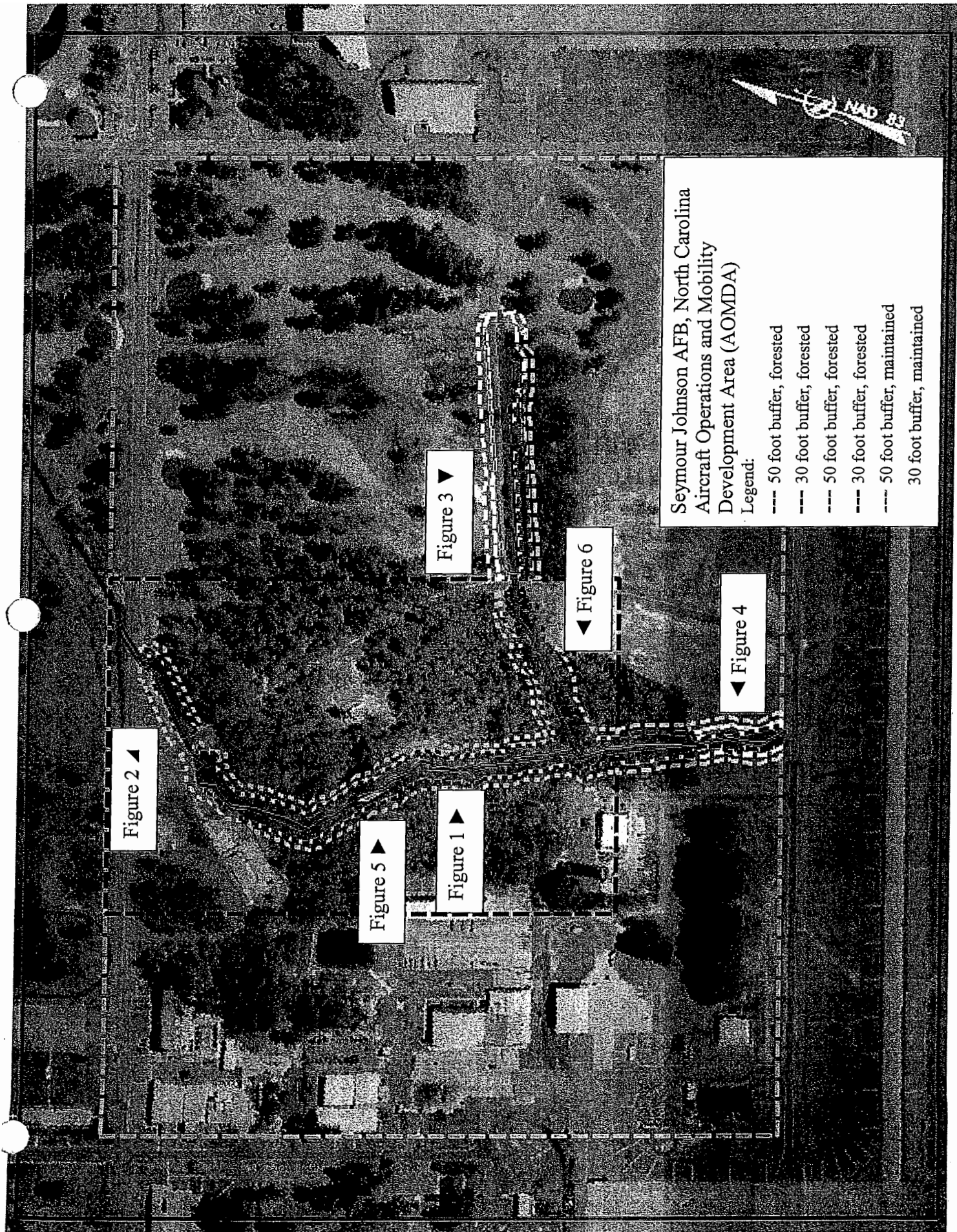
MICHAEL J. COATS, Lt Col, USAF

Attachments:

1. Map
2. Stream and Buffer Figures

cc:

US Army Corps of Engineers, Mr. Scott Jones  
NCDENR, DWQ, Mr. Bob Zarzecki



Stream and Buffer Figures

Figure 1

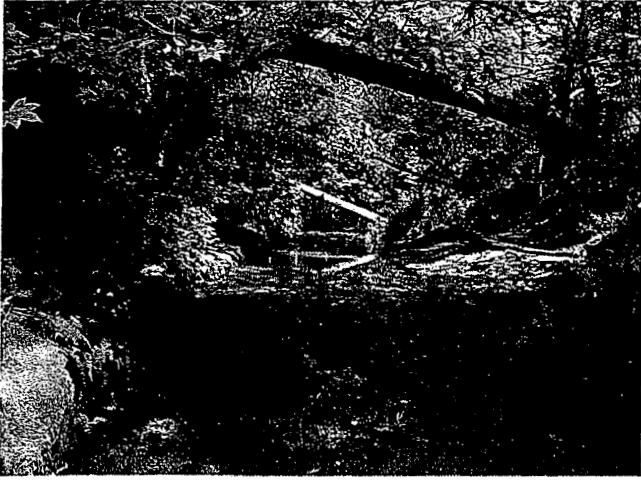


Figure 4

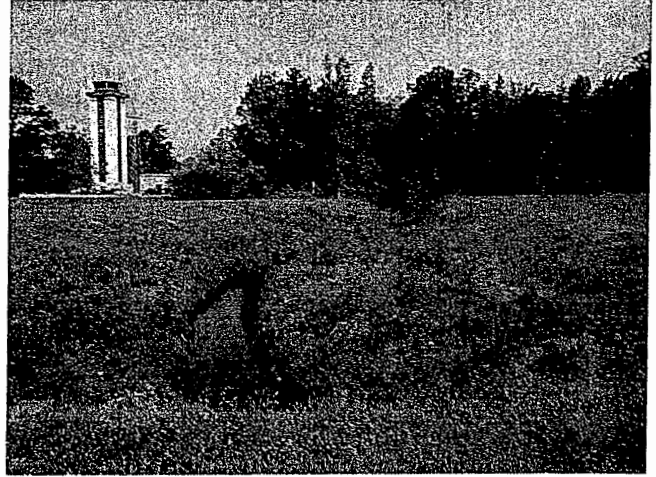


Figure 2



Figure 5

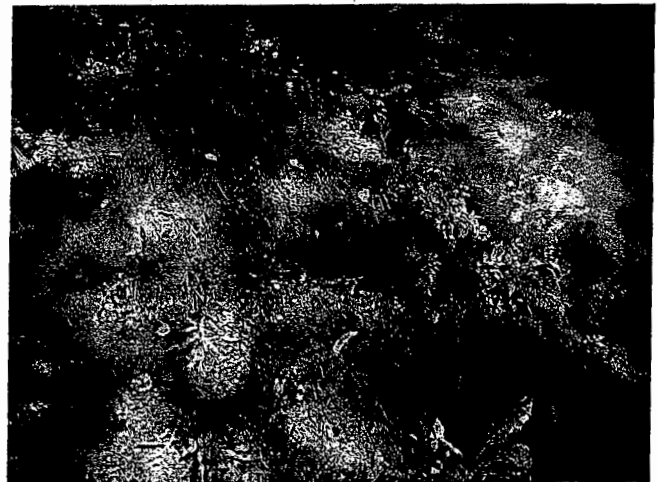


Figure 3



Figure 6



